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MYCOTIC GRANULOMATA IN AUSTRALIA.[1]

By B. B. BARRACK,
Brisbane.

UNDER the heading of mycotic granulomata I have listed actinomycosis, sporotrichosis and chromoblastomycosis.

It does not appear that any cases of North American blastomycosis (Gilchrist) or South American blastomycosis (*Blastomyces braziliensis*) have been recorded in Australia, but that is not to say that they could not exist. Cases of histoplasmosis have been reported, as well as cases of cryptococcosis, sometimes called European blastomycosis or torulosis, but in these cases the infection was of the generalized type; I am not aware that in these cases there were any skin manifestations.

Gray and Hoeben (1941) recorded four cases of infection of mycetoma type in dogs resulting from wound infection and closely resembling mycetoma in man, in which they grew on culture an actinomyces closely resembling *Actinomyces muris*; to this they gave a tentative name of *Actinomyces canis*. In their article they mention a personal communication from W. C. Sawers, in which he states that there is reason to believe that mycetoma-like lesions do occur amongst natives in northern parts of the continent; however, no cases seem to have been recorded in southern Australia.

Since this paper was first presented a case of nocardial mycetoma of the foot has been reported in THE MEDICAL JOURNAL OF AUSTRALIA of November 12, 1955, page 824, by Galena Dementjev. This occurred in a twenty-six-year-old female patient from Jandowie, Queensland.

Tinea barbæ caused by the ectothrix trichophyton of animal origin can produce granulomatous swellings of the beard region. This, however, is not a true granuloma but a suppurative folliculitis.

Deep lesions occurring in cases of *tinea corporis* caused by the Trichophytons have been recorded, but they are extremely rare. The term *tinea profunda* has been used in describing them.

Actinomycosis.

Cases of actinomycosis occur from time to time, but the patients most frequently come under the care of the surgeon. One patient showing the classical symptoms of the disease of the cervico-facial type came under my care in Brisbane, but the laboratory failed to identify the causal organism. Unfortunately this patient disappeared before further tests and cultural examinations could be carried out.

[1] Read at a meeting of the Section of Dermatology and the Section of Pathology, Bacteriology, Biochemistry and Forensic Medicine, Australasian Medical Congress (British Medical Association), Ninth Session, Sydney, August 20 to 27, 1955.

Again, since this paper was first presented a patient with actinomycosis has come under my care. A report of this case will be published at a later date.

Sporotrichosis.

Sporotrichosis is a chronic mycotic infection which produces granulomatous swellings of the skin and subcutaneous tissues; exceptionally it may become systemic. Cases have been reported from all parts of the world.

It is caused by the *Sporotrichum Schenckii* (Matruchot, 1910), of which there are several varieties. The organisms have been found in soil, plants and wood, and possibly in certain small animals and insects.

Infection takes place usually through the organism's gaining entrance through some small wound; no cases are recorded of infection from man to man. Sporotrichosis occurs most frequently in agricultural or horticultural occupations, the portal of entry being through wounds caused by pricks or abrasions. Laboratory workers are sometimes infected from cultures or infected animals.

An extraordinary epidemic occurred in the gold mines of South Africa among the native workers. Infection took place through injury to the skin—the fungus was found to be growing on the mine timber.

The following clinical types are described: (i) lymphatic, (ii) disseminated, (iii) epidermal, (iv) mucosal, (v) skeletal, (vi) visceral.

The most common is the localized lymphatic type.

In France, however, the disseminated cutaneous type is more common.

In the localized lymphatic type, as has been pointed out before, the organism gains entry through a small puncture or abrasion, usually on the thumb or finger. In about a week or more a primary lesion or sporotrichotic chancre develops. This may be in the form of a nodule or a superficial ulcer; there is generally more or less induration. If a nodule develops, it is usually not tender and is movable under the skin, but later becomes attached to the skin; it becomes inflamed and eventually breaks down. This initial lesion may persist for months.

After a latent period, usually of some weeks, nodules develop along the course of the lymphatics. This linear distribution of the nodules is characteristic of the disease. The nodules are painless and the lymph glands are not involved. These nodules are definitely under the skin, but they become inflamed and break down and discharge a viscoid, greyish-yellow pus. These lesions tend to persist indefinitely, but spontaneous healing has been reported.

There are usually no subjective symptoms. The patient is usually afebrile, and this lymphatic type seems to remain a localized process and rarely becomes systemic.

In the disseminated type there is often no visible primary lesion, the first symptom being the appearance of numerous hard subcutaneous nodules suggesting a blood-borne infection. Some of these nodules ulcerate, discharging a thin, viscid pus.

In the differential diagnosis of the lymphatic type of sporotrichosis, syphilis, other mycotic infections and pyogenic lesions are most likely to confuse the picture. Syphilis can be excluded from the history and the development, and by blood tests.

In other mycotic infections cultures may be necessary. In pyogenic infections such as pyogenic verrucose dermatitis, as described by Paul (1928) (chronic staphylococcal agminate folliculitis), pain in the initial lesion is nearly always present. Those cases in which there are outlying satellite lesions are the most easily confused with sporotrichosis; but the wart-like tags and the thick yellow pus exuding from the various small sinuses should be sufficient to permit differentiation.

In the case that I reported in this journal in 1952, the diagnosis was not difficult.

The patient said that she remembered pricking the middle finger of her right hand while gardening; a sore developed at the site of the injury and persisted for weeks. She then consulted Dr. K. G. Lawrance, of Lismore; he found an infected infiltrated sore on the dorsum of her right middle finger, and multiple indurated nodules, about the size of a pea, occurring in a line up the dorsum of her forearm. At that stage there was no obvious inflammation in any of the nodules; later all the nodules broke down and discharged pus, and later still they developed into granulomata. Local laboratory tests failed to reveal the cause of the infection. The Kahn test produced a negative result.

When I examined her a little later, the picture was so typical of sporotrichosis of the lymphatic type that I did not hesitate to make a provisional diagnosis of sporotrichosis and referred her to the Queensland Institute of Medical Research for cultural investigation. This proved the condition to be sporotrichosis.

Potassium iodide is almost specific in this disease. It is given in increasing doses. In this case the patient started with 10 grains three times a day, and increased the dose up to 30 grains three times a day. Perchloride of mercury compresses (1:5000) were applied, and followed by a dressing of glycerine and ichthyol (10%). In six weeks all the lesions had healed, and there was no recurrence.

It is of interest that since this case was published several cases have been reported, but not in all were the characteristic symptoms of the lymphatic type present.

Positive cultural results have been obtained from a chronic ulcer in a patient under treatment for Hodgkin's disease, and also in a case clinically diagnosed as chromoblastomycosis. I think that in these cases care should be exercised to exclude the possibility that the organism grown in culture is a contaminant.

Chromoblastomycosis.

Chromoblastomycosis is the name given to an exceedingly chronic type of verrucous dermatitis caused by several species of fungi belonging to the Dermatiacea family; the clinical lesions are similar, but in culture the different fungi can be identified.

E. H. Derrick, of Brisbane, was the first to identify the fungus in Australia in May, 1946, in a case from the Kingaroy district of Queensland. In November, 1946, J. D. Hicks reported a case from Cambridge Gulf, in north-west Australia. In January, 1947, Tod Stevens, of the Commonwealth Health Laboratory, Townsville, drew attention to a number of cases in north Queensland which had been diagnosed as subcutaneous mycosis and other later cases which had been diagnosed as blastomycosis; they were really chromoblastomycosis, and he confirmed this by biopsy in four cases.

The disease has existed in Queensland for many years. It was well known to older practitioners who diagnosed it as blastomycosis, as it seemed to resemble the illustrations of that disease. In several cases I was able to find yeast-like bodies in exudate expressed from the warty nodules, and concluded that the diagnosis of blastomycosis was correct. No biopsies or cultures were attempted in those early cases, as facilities were not available; however, in view of the foregoing reports, and as conditions have improved, biopsies were carried out in any new cases, and later cultural examinations, which proved this disease to be chromoblastomycosis (Barrack, 1952).

Chromoblastomycosis is characterized by the formation of slowly spreading verrucous or papillomatous lesions. These lesions are granulomata; they are yellowish-brown in colour, and they develop very slowly, spreading at the periphery with a tendency to heal in the centre, and leaving an area of atrophic skin. Papillomatous vegetations are rarely seen in Australia; in the majority of cases the lesions remaining verrucous in appearance, and only occasionally can pus or exudate be obtained. The lesion usually remains dry unless it is secondarily infected, which rarely happens. No patients have shown any large cauliflower-like growths as described by writers in other countries. The progress of the disease is so slow that an estimate can be made of the duration of the disease from its extent. The lesions are painless, and are confined to the cutaneous subcutaneous tissues; the lymph glands are not involved, and no cases of dissemination or involvement of the deeper structure have been reported.

Cases have been reported from most continents, but the majority of cases have been reported from Central America, the southern part of the United States of America, and the north of South America. It appears to be more common in tropical and subtropical areas.

In Australia the majority of cases have occurred in Queensland, mostly in the timbered humid areas from the south to the north, and to a lesser extent in the dryer western zones.

Infection takes place through some small puncture or abrasion. The fungi probably exist in various forms of vegetation, and have been grown on culture from several varieties of wood at the Queensland Institute of Medical Research.

Sutton and Sutton state that Gomes (1938) isolated the fungus, which he found was parasitic on eucalyptus trees. I have suspected that several patients (timber getters) have become infected from handling dead and decaying box timbers.

Most cases occur in males whose occupation brings them in contact with vegetation that could harbour the fungi—that is, any bush worker, or for that matter anybody in the areas mentioned. The youngest patient in my experience was a girl, aged eleven years, in whom the disease followed an abrasion of the knee.

As infection takes place through some punctured or abraded surface and the upper limbs are the most likely areas to be injured, it is here that most lesions are found. Exceptions to this are the patient I have already mentioned, and men wearing shorts, in whom lesions in the region of the knee joint have occurred.

In the Americas most lesions are reported as occurring in the lower limbs. It would appear that the clothing of the average man in the bush would protect his lower limbs.

Early lesions are rarely if ever seen, and if they were seen it is doubtful whether the disease would be suspected. It is only when a verrucous growth appears that the patient is aware of it, and these early lesions may be mistaken for a common wart.

An observant patient told me that he remembered a small punctured wound of his thumb which did not heal, and it later developed into what he thought was a wart. I examined him one year after the original injury; the lesion then measured 2·0 by 1·5 centimetres.

When it is well established, a verrucous lesion, yellowish-brown in colour, spreading at the edges and leaving atrophic areas of skin, sometimes with small satellitic areas beyond the periphery, presents a clinical picture which is characteristic of the disease. The extent of the infection depends on its age, and it sometimes involves the whole of the forearm. The scarring may lead to lymphatic blocking with some elephantiasis and deformity; but even when this occurs the lesion still retains its characteristic appearance. As I have mentioned before, pedunculated and ulcerated lesions as described in other countries are rarely if ever seen in Australia—there are no subjective symptoms. The lesions are painless and cause the patient remarkably little inconvenience. It is because of this that the lesions are allowed to develop before the patient seeks medical aid.

Chromoblastomycosis is believed to be caused by the following three fungi: *Hormodendrum pedrosoi*, *Hormodendrum compactum* and *Phialophora verrucosa*; they are closely related.

The fungi grown on culture in Brisbane were as follows: (i) *Fonsecæa pedrosoi* var. *cladosporioides Carrion*; (ii) *Fonsecæa pedrosoi* var. *cladosporium Simson*. The second variety was the more common.

The naming and classification of the fungi of this disease are at present very confusing; for instance, the term "Hormodendrum" is really a synonym for a previously described genus, Cladosporium, and this confusion will remain until some agreement is reached by the mycologists who are interested in this work.

Histologically, the lesion in section could be mistaken for carcinoma; however, the infecting organism can be seen sparsely scattered in the granulomatous tissue as small ovoid bodies, singly or in clumps, yellowish-brown and sharply contoured. The finding of the organism on microscopic examination or in culture proves the condition to be chromoblastomycosis.

In early cases the diagnosis from hyperkeratosis or true warts is by biopsy and culture. In the well-established case diagnosis does not offer much difficulty, as the clinical picture and the history are so characteristic.

Clinically the lesion most closely resembles *tuberculosis verrucosa cutis*; but as this condition is extremely rare in Queensland and is mostly confined to people dealing with infected patients and animals, it would be unusual to find it in people working in the country unless they were handling infected animals. Again in this case the diagnosis could be made only by biopsy and culture.

Pyogenic verrucose dermatitis as described by Norman Paul (1928) is recognized by the more inflammatory nature of the lesion, with wart-like tags and small sinuses filled with pus causing considerable pain on pressure. The other mycotic infections that occur in Australia do not confuse the issue.

Syphilis and leprosy should offer no difficulty; but if necessary a blood test would exclude the former, and the finding of the lepra bacillus the latter.

Prognosis.

In early cases, if the area involved is small, the disease responds well to treatment; but the older and more extensive lesions are difficult to cure. There is no danger to life, and the disease is not known to become systemic, but it is likely to persist for years. Elephantiasis of the limb may result from blockage of the lymphatics.

Treatment.

In the early cases surgical excision or electrocoagulation is often successful if the infection is in an area suitable for such treatment.

Iodide therapy should be instituted in both early and late cases. Potassium iodide is given in increasing doses, starting with 10 grains per day, the dosage being increased up to 60 grains three times a day. Iodine in other forms would be suitable.

Local treatment by the application of compresses of perchloride of mercury (1:5000) followed by a dressing of glycerine and ichthyol (12% to 20%) reduces the verrucous lesions and eliminates any secondary infection should it be present. Fungicidal ointment and paints may also help to reduce the infection and render it more suitable for X-ray therapy.

X-ray therapy can be given in one massive dose of 2000*r* to 2500*r*, or in fractional doses of 500*r* per day up to a total of 3000*r*. However, the result of X-ray therapy varies in different cases, sometimes the area involved making it difficult to irradiate it satisfactorily. Some lesions respond well; others diminish only to recur in the treated areas; and in some cases in which they recur I have successfully overcome the recurrence by freezing with carbon dioxide snow.

Calciferol therapy has been suggested and may be worth trying in suitable cases.

Summary.

Mycotic granulomata occurring in Australia are discussed, mostly in relation to sporotrichosis and chromoblastomycosis.

It is evident that more cases of sporotrichosis are being reported since Robinson and Orban reported the first case in 1951. The typical lymphatic type of the disease and its treatment are described.

Chromoblastomycosis is described as it occurs in Queensland, and it is interesting to note that more cases are being reported. I think this is due to the fact that more cases are being recognized, not only in Queensland, but in other States and in New Zealand. The treatment of this condition, both general and local, is discussed.

It is probable that, in addition to the diseases mentioned, other mycotic diseases exist, and it is only by the development of medical mycology as a special branch of pathology that improvement in the diagnosis of these conditions can be made. At the present time medical mycology is in its infancy in Australia. I feel that therein lies a wide field for research.

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SPOROTRICHOSIS AND CHROMOBLASTOMYCOSIS IN QUEENSLAND.[1]

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AND

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SPOROTRICHOSIS AND CHROMOBLASTOMYCOSIS are two chronic mycoses, which produce granulomatous lesions chiefly in the skin and subcutaneous tissue, and constitute an occupational hazard. These infections are probably more common in Australia than is generally realized.

SPOROTRICHOSIS.

It seems that sporotrichosis has been recognized clinically in Australia in the past, but only two cases have been reported (Robinson and Orban, 1951; Barrack and Powell, 1952). Both of these were of the localized lymphangitic type, and in both the disease was apparently contracted in New South Wales, although one of the cases was reported from Queensland.

Three cases of sporotrichosis, apparently contracted in Brisbane, have recently been observed (Table I). The first of these has already been described (Minty, Mead and McCaffrey, 1956), but is included here briefly for completeness. The clinical histories are as follows:

CASE I.—A male patient, aged seventy-two years, a retired dairy farmer and bank messenger, complained of an ulcer on his left wrist, which he had injured on a wooden box two years previously. The ulcer had at times almost healed, at other times enlarged. The lesion was a pale, shiny, hairless area, measuring 5·0 by 2·5 centimetres, with a shallow central ulcer measuring 2·5 by 2·0 centimetres, partly covered by a brown crust, with a base of normal granulation tissue. There were no subcutaneous nodules, and the regional lymph nodes were not involved. A radon mould was applied, the lesion healed within two months, and there has been no recurrence.

CASE II.—A male patient, aged thirty-four years, a gardener, complained of a lesion of three months' duration on the left thigh. There was no definite history of injury. The lesion was red and papular, with a small pustule in one area. It measured 2·0 by 1·0 centimetre, and was situated on the inner aspect of the thigh at the junction of its middle and lower thirds (Figure I). A biopsy was taken, and, as

[1] Read at a meeting of the Section of Dermatology and the Section of Pathology, Bacteriology, Biochemistry and Forensic Medicine, Australasian Medical Congress (British Medical Association), Ninth Session, Sydney, August 20 to 27, 1955.

TABLE I.

Sporotrichosis: Australian Cases.

Reported by.	Sex, Age (Years) and Occupation.	Geographic Site of Infection.	Probable Date of Onset.	Duration.	History of Injury.	Type of Infection and Site of Lesion.	Biopsy Findings.	Cultural Findings.	Treatment.
Robinson and Orban (1951).	Male, 70.	New South Wales, ? Sydney.	January, 1940.	——	Injury with shears while gardening.	Localized lymphangitic.	——	+	Iodides; cure.
Barrack and Powell (1952)	Female.	New South Wales, ? Lismore.	——	——	Pricked finger.	Localized lymphangitic.	Granuloma.	+	Iodides; cure.
Minty, Mead and McCaffrey (1956): Case I	Male, 72, bank messenger.	Brisbane.	October, 1952.	2 years.	Bump on wooden box in bank.	Epidermal form, left forearm.	Single and budding encysted fungal cells.	+	Radon mould; cure.
Case II	Male, 34, gardener.	Brisbane.	December, 1954.	3 months.	Uncertain.	Epidermal form, left thigh.	Numerous asteroid and tuberculate forms.	+	None; untraced; apparent beginning spontaneous resolution.
Case III	Female, 46, housewife.	Brisbane.	February, 1955.	3 weeks.	Scratched arm while weeding garden.	Epidermal form, right forearm.	Scanty asteroid and tuberculate forms.	+	Resolved spontaneously.

the lesion rapidly became smaller, it was decided to withhold treatment and observe its progress; but the patient left Australia a few weeks later.

CASE III.—A housewife, aged forty-six years, had scratched her right forearm while pulling out long grass in her garden three weeks previously. A crusted papular lesion developed on the dorsum of the forearm at this site. It was one centimetre square and appeared to become smaller after biopsy. There were no subcutaneous nodules, and the lesion subsequently healed spontaneously in a few weeks. There has been no recurrence.

Sporotrichum Schenckii was isolated in each of these three cases.

Histological examination of preparations (stained with hæmatoxylin and eosin) in each of the three cases revealed a granuloma with moderate epithelial hyperplasia. Small dermal abscesses composed chiefly of polymorphonuclear leucocytes and surrounded by a zone of epithelioid cells

FIGURE I.
Sporotrichosis: lesion on left thigh.

and giant cells were present in each (Figure II). Single or budding yeast-like bodies, 2μ to 15μ in diameter, with a colourless refractile cell wall, were found within the abscess, although they were scanty in Cases I and III. Eosinophilic encrusting material was present on some of the fungal cells, as a narrow irregular band, as prominent tubercles, or as needle-shaped rays—the so-called "asteroid body" diagnostic of the disease (Figure III).

These three Queensland cases all appear to be examples of the epidermal form of sporotrichosis. However, it is not certain what relation this disease had to a condition said to be Hodgkin's disease, for which the patient in Case II had been treated in various parts of Australia. When he was examined in Brisbane, he had no lymphadenopathy, and the electrophoretic patterns of his serum proteins, together with a lymph node biopsy, suggested sarcoidosis.

The onset of the condition in all three cases occurred during the warmer, more humid months of the year, although the series is too short to demonstrate a relation between climate and the incidence of the disease, as was noted in South Africa and in Uruguay.

It is suggested that sporotrichosis may not be uncommon in Australia, and that it may remain undiagnosed, either because it varies clinically from the localized lymphatic type, or because the fungus is scanty and perhaps overlooked in sections. It seems reasonable to suspect sporotrichosis whenever a chronic granulomatous lesion containing abscesses surrounded by a zone of epithelioid cells and giant cells is encountered, especially when other organisms are not found or are scanty.

S. Schenckii has not yet been isolated from the external environment or from animals in this country.

CHROMOBLASTOMYCOSIS.

Cases of chromoblastomycosis in Australia have been reported as follows: two cases by Saxton, Hatcher and Derrick (1946), one case by Hicks (1946), 36 cases (four proven histologically) by Stevens (1947), two cases by Barrack (1952), 31 new cases by Powell (1952), and two cases by McGeoch and Meyers (1954). Most of these cases have come from Queensland, and to them may be added a further 23 cases proven histologically or culturally which have been investigated since 1952.

Grossly verrucose lesions are not common in Queensland. The usual form observed is a scaly, violaceous plaque, sometimes ulcerated (Figures IVA, IVB and IVC). Lesions from two of the cases are interesting, in that they differ somewhat from the classical appearance of the

FIGURE IVA.
Chromoblastomycosis: lesions on the wrist.

disease. One of these must be the smallest lesion in existence, and could not be diagnosed clinically. It was the size of a pinhead, and took the form of a single intradermal abscess containing the typical dark brown septate bodies and fragments of mycelium. It overlay an epidermal cyst, and it is possible that the same trauma caused both lesions.

The other case was submitted with a diagnosis of "cyst" on the finger. The cyst wall was composed of granulation tissue, in which there were numerous small abscesses and

enormous numbers of brown bodies (some septate) and some mycelium. A splinter of wood surrounded by a foreign body giant-cell reaction lay close to the wall of the cyst. The appearance of the fungus and the granulomatous reaction were unusual, and in the absence of culture it seems possible that an organism other than the recognized causative agents of chromoblastomycosis might be involved. The reaction was similar to that in the cerebral abscesses caused by *Cladosporium trichoides*, which were described by Binford *et alii* (1952) and by King and Collette (1952), and in a deep infection of the

FIGURE IVB.
Chromoblastomycosis: multiple lesions on the hand and forearm.

hand reported by Lewis (1941). Another 12 cases diagnosed clinically as chromoblastomycosis have not been included in this discussion because of inadequate records.

Six of the cases come from localities not previously recorded. These have been added to the map published by Powell, which shows that chromoblastomycosis is widespread in Queensland (Figure V).

There were no female patients among the 35 proven cases investigated by Powell, but we have encountered two in this survey, and the causal organism was isolated from both. The youngest patient was aged six or seven years and the oldest seventy-eight years at the time of onset of the disease. The occupation of the majority of patients brought them in close contact with plant life. At least nine worked on farms, and others worked with timber. Many of the patients had some contact with cattle and horses, and some with dogs, cats, pigs and sheep. Only one of the patients stated that he had no contacts with animals.

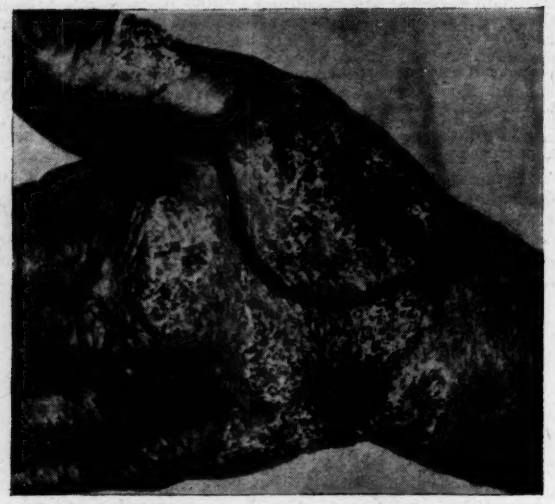

FIGURE IVC.
Chromoblastomycosis: lesions on the hand.

FIGURE V.
Distribution of chromoblastomycosis in Queensland.

The relevant information about each case is shown in Table II.

TABLE II.

Some Queensland Cases of Chromoblastomycosis.

Patient.	Sex.	At Time of Onset.			Duration of Lesion. (Years.)	Predisposing Injury.	Site of Lesion.	Size of Lesion. (Centimetres.)	Biopsy.		Treatment.	Result.	At Time of Onset.	
		Age. (Years.)	Locality.	Occupation.					Organism Grown on Culture.	Section.			Animal Contacts.	Plant Contacts.
A	M.	51	Gayndah.	Dairy farmer.	15	Bumped hand on machinery.	Right hand, dorsum.	—	*C. Carrionii.*	Fungal bodies in tissue.	—	Recurrence 1 year later.	Cattle, horses, dogs, cats.	Gardening.
B	M.	56	Charters Towers.	Postman.	6	?	Right arm.	—	*C. Carrionii.*	Fungal bodies in tissue.	Radon mould.	Completely cleared.	Horses.	Firewood.
C	M.	60	Glenmorgan.	Postmaster.	9/12	War scar bumped on wooden wall.	Left hand.	—	*C. Carrionii.*	—	—	—	Dogs, cats.	Firewood.
D	M.	52	Dalby.	Fettler on railways.	10	?	Left hand.	10·0×8·0	*C. Carrionii.*	Fungal bodies scanty.	Radon mould.	Cleared and then recurrence 7 years later.	Dogs, cats, cattle trucks.	Timber, gardening, cleaning cattle trucks.
E	M.	39 when observed.	?	?	?	?	?	—	*C. Carrionii.*	Fungal bodies in teased tissue.	?	?	?	?
F	M.	18 to 20	Tully.	Dairy and cane farmer.	30 to 32	?	Upper part of left thigh	3·0×1·5	*C. Pedrosoi.*	Fungal bodies in teased tissue.	?	?	Cattle, horses.	Cane.
G	F.	6 to 7	Abercorn.	Schoolgirl on dairy farm.	2 to 3	?	Right knee.	1·0×0·5	*C. Carrionii.*	Fungal bodies in teased tissue.	Radon mould.	Completely cleared.	Cattle, horses, dogs, fowls.	Timber, firewood.
H	M.	21	Abercorn.	Dairy farmer.	7	?	Chest.	—	—	Fungal bodies in teased tissue.	?	?	Cattle, horses, dogs, cats, pigs.	Timber, firewood, sorghum, lucerne.
I	M.	18	?	Station hand.	2	?	Third finger left hand.	0·5×0·25	*C. Carrionii.*	Fungal bodies in teased tissue.	?	?	Cattle, horses.	?
J	F.	16	Rosewood.	Home duties and milking.	1	?	Right cheek.	—	*C. Carrionii.*	Fungal bodies in teased tissue.	Radon mould.	Cleared.	Cattle, horses.	—
K	M.	50 when observed.	?	?	—	—	Left forearm.	—	—	Fungal bodies in teased tissue.	?	?	?	?
L	M.	63	Chinchilla.	Council labourer.	1	?	Left wrist.	—	—	Fungal bodies scanty.	Area irradiradiated.	Completely cleared.	—	—
M	M.	34 to 35	Surat.	?	8 to 9	Burn.	Left elbow.	—	—	Fungal bodies in tissue.	Radon mould.	?	?	?
N	M.	58 when observed.	Gayndah.	Dairy Farmer.	"Many."	?	Right thumb.	2·0×2·5 ×0·4	—	Fungal bodies and mycelium in tissue.	—	Completely cleared.	Cattle, horses.	Gardening, timber.
O	M.	46	Warwick.	Fettler on railways.	8	?	Left forearm.	—	—	Fungal bodies in tissue.	Radon mould.	—	Cattle.	Gardening, timber.
P	?	?	?	?	?	?	?	—	*C. Carrionii.*	?	?	?	?	?
Q	M.	60 when observed.	?	?	?	?	?	—	—	Fungal bodies in tissue.	Excised.	?	?	?
R	M.	58 when observed.	?	?	?	?	Left hand and left elbow.	6·0×1·0 3·0×2·0 ×0·5	—	Fungal bodies in tissue.	?	?	?	Timber.
S	M.	33 when observed.	?	?	?	?	Left forearm and nose.	—	—	Fungal bodies scanty in tissue.	Radon mould.	?	?	?
T	M.	63	?	?	1	?	Thumb and hand.	—	—	Fungal bodies numerous in tissue.	Radon mould.	Cured.	?	?
U	M.	8	Ceratodus.	School boy on dairy farm.	3	?	Left knee.	3·2×1·6 ×0·3	—	Fungal bodies in tissue.	Superficial X-ray therapy.	?	Cattle, horses.	?
V	M.	78	?	?	3/12	?	Left hypothenar eminence.	—	—	Fungal bodies in tissue.	Excised.	?	?	?
"X"	?	?	?	?	?	?	Finger.	—	—	Fungal bodies and mycelium in tissue.	Excised.	?	?	?

TABLE III.

Histological Aspects of Some Queensland Cases of Chromoblastomycosis.

Section Number.	Patient.	Intra-epidermal Abscess.	Dermal Abscess.	Giant Cells.	Epithelial Hyperplasia.	Fungi.	Epithelioid Cells and Pseudo-tubercles.	Fibrosis.[1]
1	T.	+	+	++	++	++	+	
2	O.	++	+	++	+	+++	++++	+
3	W.	+	++	+++	+	+++	++	+
4	W.	+	++	+++	+	+	++	+
5	S.	—	++	++	+	+	++	+
6	F.	++	++	+	++	++	+	
7	K.	—	+	+	++	+	++	+
8	T.	+	++	+++	+++	+++	++	+
9	R.	++	++	++	+++	+	+	+
10	Y.	+	++	+	++	++	+	
11	Z.	+	+	++	++	+	++	
12	AA.	+	+	+++	+++	++	+	
13	BB.	++	++	+++	++	++	++	+
14	A.	+	+	++	++	+	+	
15	Q.	++	+	+++	++	+	+++	+
16	CC.	+++	+	+++	+++	+++	+++	
17	CC.	+++	+	+++	+++	+++	+++	+++
18	A.	(Minute shaving containing numerous fungal cells and mycelium.)						
19	O.	++	++	+++	++	++	+++	
20	D.	+	+	+	++	+	+	
21	CC.	+	+++	++	++	+++	+	
22	DD.	—	+	+++	++	+++	+++	+
23	EE.	+	—	+	+	+	+	
24	L.	—	—	+	++	+	+	+++
25	N.	+	+	++	+++	++	+	+
26	J.	—	++	+++	+++	+	++	+

[1] Material frequently inadequate for demonstration of fibrosis.

Histological Findings.

Histological preparations from 22 cases of chromoblastomycosis were available for study. In general, the microscopic appearance was that of a granuloma, associated with a variable, often gross, degree of epithelial hyperplasia (Figure VI). In most cases, there were numerous giant cells and small abscesses in the dermis and epidermis. Pseudotubercles were common, but there was no caseation. The diagnostic feature was the presence of light to dark brown, thick-walled, septate fungal bodies (Figure VII). These measured from 5μ to 15μ in diameter, and occurred singly or in clusters in the giant cells, in the centre of the abscesses, or free in the tissues. The cells and some mycelium were frequently found in epidermal scales. Budding was not seen, although adjacent fungal cells varied greatly in size. The fungus was usually present in large amounts, and the diagnosis was obvious. Fibrosis of the deeper layers of the dermis was common. A foreign body, a splinter, was found in only one case, that quoted above.

Mycological Considerations.

Nomenclature.

A great detail of confusion exists about the taxonomy and nomenclature of the fungi which cause chromoblastomycosis. The species are constantly being reclassified and their terminology altered. *C. Pedrosoi* has been placed in nine different genera: *Acrotheca*, *Trichosporium*, *Gomphinaria*, *Botryoides*, *Hormodendroides*, *Phialophora*, *Phialoconidiophora*, *Fonsecæa* and *Cladosporium*. Much of the confusion has arisen because different people have emphasized different types of conidial formation, which may take three forms—the *Cladosporium* type, the *Acrotheca* type or the *Phialophora* type. Some of the species are capable of sporulating by all three methods; others show only the *Cladosporium* type or *Phialophora* type, despite culture on various media.

Conant (1954) prefers to use the generic name *Hormodendrum* for all "those fungi which sporulate in an acrogenous (borne at tip), acropleurogenous (borne at tip and sides) or pleurogenous (borne at sides) manner, with single conidia or conidia in short or long chains, with some strains also developing a few or many flask-shaped conidiophores which produce spores semi-endogenously from a terminal cup".

Hormodendrum is considered a synonym of *Cladosporium* by many authors (Thom, 1940; Langeron, 1945; Emmons, 1952; Trejos, 1954); although it is still treated separately in many reference books. The type species of both genera are saprophytic forms, which differ little from one another, to judge from available descriptions, and the parasitic species have similar conidiophores, although they may also have the other types mentioned above. *Cladosporium* has priority under the International Rules of Botanical Nomenclature, and Conant's action in retaining *Hormodendrum* tentatively for the species parasitic in man, on the grounds that it was thought less confusing, is botanically indefensible.

Confusion has also existed about the specific name of one of these fungi; but as Trejos (1954) has given the name *Carrionii* to this species and accompanied his description with a Latin diagnosis, this must be regarded as its valid name.

The names here recognized for the fungi which cause chromoblastomycosis are as follows:

1. *Cladosporium Pedrosoi* (Brumpt, 1922) n. comb.
2. *Cladosporium compactum* (Carrion, 1935) n. comb.
3. *Cladosporium dermatitidis* (Kano, 1937) n. comb.
4. *Cladosporium Carrionii* Trejos, 1954.

   Fonsecæa Pedrosoi var. *cladosporium* Simson, 1946, and *Fonsecæa cladosporium* Powell, 1952, invalidly proposed under the Rules, are *nomina nuda*.
5. *Phialophora verrucosa* Medlar, 1915.

Isolation from Cases.

The causal organism was isolated from 10 of these cases. The procedure followed was that described previously by Powell (1952). *C. Carrionii* was isolated in nine instances and *C. Pedrosoi* in one. There have now been 26 isolations of *C. Carrionii* and three of *C. Pedrosoi* from cases of chromoblastomycosis in Australia. This third isolation of *C. Pedrosoi* is of interest in extending the known distribution of this species to north Queensland.

McGeoch and Myers (1954) reported that the causal organism from one of their cases was *H. compactum*, but they gave no description. This species has not previously been recorded in Australia. In fact, only four other strains of *C. compactum* have been isolated, one in Puerto Rico, one in Tennessee (Conant, 1954), and two in Venezuela (Trejos, 1954). There are no known isolations of *C. dermatitidis* or *Phialophora verrucosa* in Australia.

Natural Occurrence.

The causative organism of chromoblastomycosis probably lives saprophytically on wood. The epidemiological

history of some of the patients rather suggests it; a splinter was found in one of the lesions reported above, and *P. verrucosa* has been shown to be identical morphologically and serologically with strains of *Cadophora americana* isolated from wood pulp (Conant, 1937; Martin, 1938).

Powell (1952) reported a case from Abercorn, a small township with a population of about 60, approximately 300 miles north-west of Brisbane. A second case was diagnosed clinically, and when a strain of *C. Carrionii* was isolated from a third case, it was decided that this was a suitable place to begin a search for the source of infection.

Leaves, bark and twigs from growing and dead trees, samples of vegetation, timber, sawdust, soil *et cetera* were collected from a number of properties. Many strains of *Cladosporium* were isolated, and those that grow adequately at 32° C. were compared with the strain of *C. Carrionii* isolated from the third patient. Two isolates from splinters off the fence near the home of this patient proved to be morphologically and serologically indistinguishable from *C. Carrionii*. They were then inoculated into the skin of volunteers, lesions developed, and the fungus was recovered from them. The findings will be reported in detail later.

SUMMARY.

Three cases of the epidermal form of sporotrichosis occurring in Brisbane are described. Two are new, bringing the number recorded from Australia to five. *S. Schenckii* was isolated from all three, and fungal cells were found in the tissues. It is suggested that the infection is more common than has been supposed.

Twenty-three new cases of chromoblastomycosis are recorded from Queensland. *C. Carrionii* was isolated in nine instances and *C. Pedrosoi* in one.

Two strains of an organism closely resembling *C. Carrionii* have been isolated from fence posts in south Queensland, and have produced lesions in the skin of volunteers inoculated with suspensions of the cultures.

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Legends to Illustrations.

FIGURE II.—Sporotrichosis: sections showing cellular reactions.

FIGURE III.—Sporotrichosis: fungal cells and asteroid bodies in tissue.

FIGURE VI.—Chromoblastomycosis: section showing cellular reactions.

FIGURE VII.—Chromoblastomycosis: fungal cells in tissue.

THE USE OF "BILIGRAFIN" IN INVESTIGATION OF THE POST-CHOLECYSTECTOMY STATE: THE RESULTS IN 224 CHOLECYSTECTOMIES AT SAINT VINCENT'S HOSPITAL, SYDNEY.

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THIS paper describes the results in 224 cholecystectomies performed at Saint Vincent's' Hospital, Sydney, in the years 1952 and 1953, and reports on the use of "Biligrafin" in the investigation of the post-cholecystectomy syndrome. Of these 224 patients, four died as a result of the operation, 10 are untraced because of change of address, and seven have died since the operation from incidental causes, leaving a total of 203 traced and all but four personally interviewed. There were 44 males and 180 females in this series.

An attempt has been made to compare the pre-operative with the post-operative symptoms and to analyse in some detail those cases in which the results have not been altogether satisfactory. The degree of relief obtained from each type of symptom common to gall-bladder disease has been analysed. Barium meal X-ray examination was used to demonstrate evidence of peptic ulceration and hiatus hernia in the group unrelieved by operation. Investigation of the bile ducts in the unsatisfactory group, along with the control group from the patients who were symptom-free, was carried out by means of "Biligrafin".

"Biligrafin" is a medium for intravenous use prepared by Schering, Proprietary, Limited, and used in the radiographic demonstration of the bile ducts and gall-bladder. It is actively excreted by the liver cells, usually in a sufficiently concentrated form to give satisfactory films of the bile ducts even in the absence of the gall-bladder. In the presence of impaired liver function most of the agent is excreted in the urine—often producing good urograms. In these cases the ducts cannot be seen, nor is the medium visible in the duodenum. There is, therefore, no point in investigating jaundiced patients with "Biligrafin".

Pain.

Pre-operative pain was described as severe or mild, the latter term embracing vague forms of discomfort. Of the 220 cases in which pain was present, in 200 it was described as severe and in 20 it was mild. In four cases pain was absent, the gall-bladder disease being found coincidently during investigation of some other complaint. The commonest sites of pain distribution were as shown in Table I.

In 97 of the 200 cases in the "severe" group, pain was said to be intermittent and of a colicky nature. In 36 cases attacks of pain lasted less than one hour, while in 66 they lasted more than one hour but less than twelve, and in the remainder the pain was of longer duration or there was insufficient information available to assess it adequately. There was no evidence that the length of history of pain before operation was in any way related to the presence of symptoms after operation.

TABLE I.

Site of Pain.	Male Subjects.	Female Subjects.	Total.
Right hypochondrium ..	30	99	129
Epigastrium	21	89	110
Shoulder blade and back	17	63	80
Elsewhere in chest and abdomen..	11	42	53

Of 200 patients complaining of severe pain before operation, 38 (19%) still complained of severe pain after operation; in 32 of these cases the pain occupied the same site and was of the same severity as the pre-operative pain. In six of these 38 cases, the severe pain was new in its site and nature. These cases are listed as follows:

Intestinal colic associated with bowel obstruction due to adhesions	1 case
Large bowel colic with diarrhœa	1 case
Pain in right and left iliac fossæ	1 case
Pain associated with duodenal ulcer	2 cases
Renal pain associated with ureteric obstruction	1 case

There remained some 32 patients who described their symptoms as similar in site, nature and severity to the pre-operative pain. Four of these experienced only one bout of severe pain, and have now been free from symptoms for over twelve months. "Biligrafin" studies in these four cases revealed no abnormality. Twenty-eight patients, therefore, have repeated attacks of severe pain, which they state are similar to the pre-operative pain. Close analysis of this group reveals that nine are now being treated for conditions which more than likely were the cause of their pain at the time of their gall-bladder operation, although the gall-bladder in each case was definitely diseased. One of these patients developed carcinoma of the rectum, with secondary deposits in the liver. Her pain was associated with liver involvement. Three patients have developed large bowel disease, one ulcerative colitis and two diverticulitis. One patient complains of renal colic and has a ureteric calculus. One has a pre-pyloric ulcer, and three have cardiovascular disease with substernal pain and hypertension. Treatment for these conditions has afforded relief to the patients in all but the first case. There remained 19 patients (11·7%) who after cholecystectomy showed no clinical cause for their continued symptoms.

It was thought at the outset of this survey that a study of the biliary ducts in this unsatisfactory group of 38 patients might throw some light on the residual symptoms, particularly when the findings were compared with those of the control group of the same number who were symptom-free. In addition, we welcomed the opportunity to study the duct system in the latter group in order that the criteria of normality after cholecystectomy could be determined.

Radiographic Technique.

Prior to the examination patients were prepared with a bowel washout, or failing this a purgative was given twenty-four hours before the appointed time. On no account would we proceed till a plain film of the right hypochondrium showed an absence of gas and fæcal shadows. The right posterior oblique position was used, with just sufficient rotation of the patient for the image of the common ducts to clear that of the spine. Patients were more comfortable than in the left anterior oblique position, and in addition the intravenous injection was facilitated. Forty cubic centimetres of "Biligrafin" were given intravenously, at least five minutes being taken for the injection. Initially no test was made for sensitivity, since it had been our experience with intravenous pyelograms that the results of these tests had little or no bearing on the subsequent reactions of the patients. However, a near catastrophe at another hospital caused us to reflect on the medico-legal aspects and in subsequent cases to inject one cubic centimetre of the medium approximately fifteen minutes before the remainder was given. Very few of the patients suffered any reaction, and these complained only of nausea or of a feeling of heat. Films were taken at ten, fifteen, twenty, thirty and forty-five minutes. As far as possible, all of these were taken in the low kilovoltage range (40 to 60) with high milliamperage and as short a time as possible, in order to increase the contrast. The following observations were made on the control group, who after operation were completely symptom-free.

Results of Investigation.

The results of the investigation may be set out as follows:

1. In the majority of cases, after cholecystectomy the bile ducts dilate. The common duct averages one centimetre in diameter (Figure I).

2. In two cases the ducts were larger than this (see Figure II).

3. In some cases the common duct was about the same size as that seen in normal individuals who have not had cholecystectomies.

4. The medium appears in the duodenum in about twenty minutes.

5. In most cases the common bile duct is dilated. Pronounced tapering occurs at the sphincter of Oddi. This tapering must not be tken as evidence of stricture. It is presumed that the latter would manifest itself not only by a dilated duct, but also by delayed appearance of the "Biligrafin" in the duodenum.

6. Cystic duct remnants were seen in three cases. If any portion of the cystic duct was seen it was considered as a remnant (see Figure III). It is realized that it is not always demonstrated by this method of examination.

7. In two cases, residual calculi were present in the common ducts (see Figure IV).

In the "severe" group, 30 "Biligrafin" studies were made. Twenty-five of these showed no abnormality. Five were abnormal and showed the following features: (i) There were pronounced cystic duct remnants in two cases. (ii) The bile duct was grossly dilated in two cases. (iii) Stones were present in one case. (iv) There were two cases in which there was delayed excretion of the medium to the bowel. (v) No cases were encountered in which the medium was visible in the bowel but not well defined in the ducts. It is presumed that such a state of affairs would occur with hypotonicity of the sphincter.

While it is difficult to draw any conclusions from such small numbers, it would appear that there is no relationship between duct size and residual symptoms. That is to say, large ducts and small ducts occur with equal frequency in the controls and in the groups with the post-cholecystectomy syndrome. Delayed excretion of the "Biligrafin" into the duodenum was always associated with a dilated duct, and in this survey with symptoms. The converse did not follow—that is, dilated ducts were not necessarily an indication of delayed evacuation. To reiterate: grossly dilated ducts in the post-cholecystectomy state did not indicate any definite obstruction, nor can symptoms be necessarily traced to this finding. It would be wise to

search further afield for the cause of symptoms before exploring a duct on the "Biligrafin" evidence of dilatation. It was seen that the cystic duct remnant was present in more cases in the control group than in the symptom group, and that its presence does not cause symptoms. One should be on guard against accepting a cystic duct remnant as the explanation of symptoms. It was thought that the presence of calculi would no doubt account for some of the residual symptoms. We were surprised, therefore, to find that the control group had two cases of calculi and the symptom group only one. Our small investigation did not support the contention that the most common cause of recurrent symptoms after cholecystectomy is a stone in the common duct. It must be admitted, however, that failure to demonstrate a calculus does not by any means exclude its presence.

Barium Meal X-Ray Examinations.

There were 31 barium meal X-ray examinations performed in the symptom group, of which 21 gave normal findings. Abnormal findings recorded were 10 in number, and are listed as follows:

Duodenal ulcer	2 cases
Duodenal diverticula	3 cases
Prepyloric ulcer	1 case
Duodenal deformity	3 cases
Hiatal hernia	1 case

In the control series, 31 of the barium meal X-ray examinations were reported on as revealing no abnormality and four showed some abnormality, as follows:

Duodenal ulcer	1 case
Duodenal diverticulum	1 case
Duodenal deformity	2 cases

The barium meal examinations were made by different radiologists and, contrary to the usual procedure, no attempt was made to elicit any history of the patient's symptoms. In other words, unless these were volunteered the examining doctor had no idea from which group the patient came. The findings are interesting, in that it is apparent that gastro-duodenal disease is more common in the symptom group. The only criterion of duodenal ulceration which was taken was the presence of an ulcer crater. Duodenal deformity had to be discounted, as it could be due to previous ulceration, gall-bladder disease or cholecystectomy. Colcock and McManus (1955), in a review of over 1000 cholecystectomies, showed that duodenal ulceration was present in 90 patients, duodenal distortion in 18, and diverticula in 26.

Primary duodenal diverticula are stated usually not to produce symptoms, and this would to a certain extent be supported by the figures. However, it has been the impression of one of us (J.H.H.) that these diverticula are not as innocuous as reported.

After analysis of the 38 cases in which post-operative symptoms occurred, we were able to reduce this figure to 19 in which there was no detectable clinical cause to account for the symptoms. This group forms the subject of a separate investigation, to be reported later. Investigations by "Biligrafin" and barium meal X-ray examination revealed the following findings in these 19 cases:

Dilatation of common bile duct	2 cases
Dilated common bile duct with stone	1 case
Duodenal ulcer	1 case
Cystic duct remnant	1 case
Duodenal diverticula	2 cases
Duodenal deformity	2 cases
No abnormality	10 cases

Three of these 10 patients have gained considerable relief from reassurance and antacids.

Jaundice and Exploration of Common Bile Duct.

In the 224 patients under review, a history of jaundice was obtainable from 76, of whom 19 were jaundiced on their admission to hospital. Of the 57 patients whose history of jaundice was not recent, or at least the jaundice had subsided before the patient's admission to hospital, only 18 had their bile duct explored, and it is of interest that subsequently none of these 57 patients has been troubled with jaundice. "Biligrafin" studies in these, however, showed the presence of stone in two of the 57 cases. When the histories of these two cases were reviewed, there was no evidence at the time of operation that the bile duct was dilated, nor was there any other indication for exploration of the duct other than a previous history of jaundice. It would appear that the presence of stone in the bile duct is compatible with freedom from symptoms and freedom from jaundice, at least for some time.

Of the 19 patients jaundiced on their admission to hospital, 16 had their bile ducts explored. Stones were found in only eight of these. Three of the 19 patients did not have their ducts explored and are symptom-free now, but "Biligrafin" studies show stones present in the common bile duct in one of these cases.

Of the total of 76 patients, only one developed jaundice subsequent to operation, and "Biligrafin" studies showed a grossly dilated bile duct. This patient is suffering from degenerative disease of the cerebellum, and his bile duct has been explored on two occasions since his original operation. No obstructing lesion was found on either of these occasions, but the patient has an intermittent biliary fistula, and his present general condition precludes further operation. At the time of the explorations of his bile duct a T-tube was placed in the lumen and cholangiograms have been prepared without revealing any obstruction. However, in view of the dilated duct and the biliary fistula, it would appear that some obstructing lesion must be present.

Of 76 cases in which there was a history of jaundice, the bile duct was therefore explored in 34, and stones were found in 12. The duct was dilated and contained stones in 10. In an equal number of cases it was dilated, but no stones were found on exploration. The actual mortality rate in the group in which the ducts were explored was three deaths in 36 cases. The causes of death in these three cases were pancreatitis, peritonitis and pulmonary embolism. Stone was found in only one of the three cases in which death occurred, and this patient died from pulmonary embolism. Neither the patient who died from pancreatitis nor the one who died from biliary peritonitis had stones present in the bile duct at operation. The figures are small and may not give a true picture, but they do confirm the higher mortality rate said to be associated with this operation. "Biligrafin" studies on the patients in whom the duct had been explored showed no sign of stricture or deformity, either with the use of a T-tube or in cases in which a T-tube was not used.

At Saint Vincent's Hospital the tendency has always been towards closure of the bile duct without intraluminal drainage (Miller, 1934). We were surprised to find that in the years under review the T-tube was used in 12 of the 36 ducts explored. Of the three deaths after bile duct exploration, two were probably directly due to exploration and dilatation, and in neither of these cases was a T-tube used.

Of the 34 patients with a history of jaundice who had their bile duct explored, six have complained of severe pain since operation and the remainder have been completely relieved or have mild symptoms.

There were 12 patients with a history of jaundice and a normal sized common bile duct at operation. In two patients stones were palpable before the ducts were opened and in the remaining 10 patients no stones were found on exploration. Since the mortality rate for exploration was high (three in 36), it appears to the authors that operative cholangiograms could play their most useful role in this particular group. Operative cholangiography has some definite limitation in its interpretation, but taken along with mobilization of the duodenum and a more accurate palpation of the lower end of the bile duct it may prevent the duct from being opened unnecessarily, a procedure which may carry the risk of a higher mortality rate. Table II shows the indications for exploration of the common bile duct in this series, along with the incidence of palpability of stones present before the bile duct is opened.

TABLE II.

Reason for Exploration of Common Bile Duct.	Number of Ducts Explored.	Stones Palpable Before the the Duct was Opened.	Stones Found.	Symptoms Now.		Dilated Duct on "Biligrafin" Study.
				Severe.	Mild.	
Jaundice on admission	5	1	1	2	1	—
Jaundice on admission and dilated common bile duct	11	4	7	4	1	2
Recent jaundice	7	1	1	—	1	—
Dilated common bile duct	1	—	—	—	—	—
History of jaundice	8	2	3	—	2	—
Accidental	3	—	—	—	1	—
Stone felt in common bile duct	1	1	—	—	—	—
Total	36	9	12	6	6	2

To recapitulate, only 18 of 57 patients with a pre-admission history of jaundice had the duct explored. A stone was found in three cases. There were no stones found in normal sized ducts that were not palpable before the duct was opened. Of 19 patients jaundiced on their admission to hospital, 16 had the bile duct explored and stones were found in only eight. Of the three jaundiced patients whose ducts were not explored, a stone has been shown present in one since operation. Ducts were dilated and explored in 20 cases; in 10 of these a stone was found. Three patients died out of 36 whose ducts were explored, and two of these deaths were probably directly due to the exploration. These two patients who died had no stones present on exploration.

Figures V and VI illustrate the improvement in the histological appearance of the liver following the removal of the stone which had been causing obstruction to the bile duct for some six weeks. The first liver biopsy was taken at operation and showed an extensive degree of portal fibrosis. Two months later a further liver biopsy was taken and this shows the improvement which has taken place since the relief of obstruction.

Other Symptoms.

Vomiting.

It is not generally recognized that vomiting is a common symptom in gall-bladder disease. It occurred independently of pain in 34 cases before operation, and was completely relieved in only 11 of these. Whether the symptom is due to gall-bladder disease, or whether it is associated with gastritis, as suggested by Wood, cannot be stated in this series. Vomiting occurred in association with pain in 137 out of 224 patients.

Fat Dyspepsia.

Fat dyspepsia occurred in 171 of 224 cases, and of these only 58 patients were relieved of this symptom after operation.

Mucocele and Empyema.

There were 20 cases of mucocele and 10 of empyema. These two conditions occurred more frequently in the male than in the female, there being some 13 cases among the 44 males reviewed. The presence of stone was recorded in 35 of these cases and there was no reference to stone in five. Pain was present for longer than twenty-four hours in 12 cases, for less than 12 hours in three cases and for less than six hours in 15 cases. Post-operatively, severe symptoms persisted in only three cases out of these 30. The mortality was one death in the 30 cases, the death being due to peritonitis.

Complications.

The over-all mortality rate for these 224 cholecystectomies was 1·7%. The mortality rate for cholecystectomy without exploration of the common bile duct was 0·4%. Common bile duct exploration was associated with a mortality of three deaths in 36 cases.

Incisional hernia occurred in 17 cases, an incidence of 4·9%.

Wound infection was recorded in 10·7% of our cases, and was highest in the mucocele-empyema group. Severe cardiac complications—for example, tachycardia and fibrillation—occurred in 4·9% of the cases. Chest complications were recorded in 19%. Venous thrombosis of the lower limbs occurred in four cases in the post-operative period, and fatal pulmonary embolism occurred in one of these.

Summary.

The results of 224 cholecystectomies are reported. An analysis of the degree of relief from each symptom is made. The use of X-ray barium meal and "Biligrafin" investigations in the post-cholecystectomy syndrome is analysed. The difficulty of pre-operative diagnosis of stone in the common bile duct is noted.

Acknowledgements.

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Legends to Illustrations.

FIGURE I.—Normal common bile duct.

FIGURE II.—Dilated common bile duct with delayed emptying.

FIGURE III.—Dilated common bile duct with cystic duct stump.

FIGURE IV.—Stones in dilated common bile duct.

FIGURES V AND VI.—Liver biopsy showing portal tract before and after removal of stone from an obstructed bile duct.

NEPHROBLASTOMA: WILMS'S TUMOUR.

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"WILMS'S TUMOUR" is the name used to designate the malignant embryonic tumour of the kidney which was first adequately described by Wilms in his monograph of 1899. Many other names have been given to it reflecting ideas as to its nature—mixed tumour of the kidney, embryoma, adenosarcoma, rhabdomyosarcoma, nephroblastoma. "Wilms's tumour", however, is the title by which it is most widely known, and it seems appropriate thus to do honour to the man who was the first to recognize the tumour as an entity. It is of interest to the pathologist, the surgeon and the radiotherapist alike in virtue of its unusual ætiology on the one hand and the challenge of its high mortality on the other.

In this article a series of 26 cases is discussed. These represent the total number encountered at the Royal Children's Hospital, Melbourne, during the period 1945 to 1955.

Pathology.

The tumour usually presents in the first three years of life, and practically invariably in the first decade. Very occasionally adults are affected. It is noteworthy that such tumours have been found in the fœtus, as in the case of a still-born male reported by Nicholson in 1931, and that of Silver who, in 1947, recorded the presence in an infant, aged three days, of a tumour which had caused obstruction to delivery.

The incidence in the sexes appears equal, nor is one kidney more liable to the disease than the other. Uncommonly the condition may be bilateral, and whilst most of these cases are probably examples of double primary neoplasms, in others it seems likely that one kidney is the seat of a secondary deposit.

These statements as to age, sex and side are borne out in the present series, as will be seen in Table I.

TABLE I.

Wilms's Tumour at the Royal Children's Hospital, Melbourne, 1945 to 1955: 26 Cases.[1]

Age Group. (Years.)	Number of Cases.
0 to 1	3
1 to 2	9
2 to 3	6
3 to 4	4
4 to 8	4

[1] Sex ratio: 13 male patients, 13 female patients. Kidney affected: right, 13 cases; left, 11 cases; both kidneys, two cases.

The varied histological picture with its multiplicity of cells and tissues has forced the conclusion that the tumour has its genesis in embryonic cells of either the Wolffian ridge or the metanephros. Nicholson (1931) postulated that the neoplasm was both congenital and embryonic, whilst Willis (1953) makes the important statement that "there is no doubt that in a high proportion of cases they are already present at birth". The tumour arises in the medulla of the kidney, and as growth proceeds distends the cortex, which becomes stretched over the mass like a capsule, anchoring the bulk of the kidney to its periphery (see Figure I). Eventually the "capsule" is transgressed and infiltration of adjacent structures commences; but this tends to be a late occurrence, as does invasion of the renal pelvis.

Tumours vary greatly in size, but are generally massive when first seen, especially in comparison with the dimensions of the child. The cut surface presents a varied appearance. It is mainly solid and of greyish-red colour; but areas of frank hæmorrhage are common, whilst liquefaction and necrosis may be evident. Cartilage or even bone is occasionally present. The edge of the neoplasm is usually clearly demarcated and has the renal pelvis compressed against it.

Microscopically tissues of several types are visible, both epithelial and connective tissue elements being represented. The basic cell is small, round and anaplastic. It is present in solid masses and may be seen differentiating to form imperfect tubules and glomeruli on the one hand, and mesoblastic structures such as smooth or striated muscle fibres, cartilage, or possibly bone on the other (see Figures II and III). It follows that the neoplasm is not really a "mixed tumour".

The malignant process spreads by local infiltration, by the lymphatics to local lymph nodes, and above all by the blood-stream. There may be direct extension along the renal vein, whilst distant metastases develop particularly in the lungs, but also at times in the liver, the bones, the brain, the spleen and perhaps the other kidney. These usually appear within a few months of recognition of the disease unless treatment is effective in delaying or preventing them. So regular is their early appearance that it has been said that, should a patient survive for two years without metastasis, cure is very likely. However, there are cases on record in which the appearance of metastatic deposits has been delayed for lengthy periods after apparently effective treatment. One child in this series died six years after treatment (by nephrectomy and post-operative irradiation) from what was almost certainly secondary malignant disease in the liver (ultimate proof is lacking as an autopsy was not obtained); while Rusche (1951) reports the development of a metastasis in the eleventh rib eight years after nephrectomy. One cannot but think that talk of "two year cures" is unwarranted and apt to be misleading.

Clinical Features.

The clinical features are as follows.

A child, aged three years or under, is noticed by its mother to have an abnormally large abdomen, perhaps "a lump in its stomach"; or again the onset may be with general features such as asthenia, anorexia or vomiting. Rarely hæmaturia is the first symptom (this was so in four of the cases reported here). As an excessive rarity acute abdominal features, due to hæmorrhage within the tumour mass and its rupture into the peritoneal cavity, precipitate the clinical picture (Huguenin *et alii*, 1955).

The tumour has the characteristics of a renal swelling and tends to be large; it may occupy most of one side of the abdomen and at times encroach on the other. It is usually fixed and non-tender. The surface is characteristically smooth and rounded, but may be lobulated. Rarely these signs are bilateral.

Hypertension was noted by Silver (1947), occurring in seven out of eight cases in which the blood pressure was recorded. Cox and Smellie (1955-1956) report severe hypertension in a child, aged fourteen months, in whom the blood pressure reverted to normal after removal of a Wilms's tumour; death from general dissemination occurred eight months later. In the five instances in which the blood pressure was estimated in the present series, a normal finding was recorded.

Hæmaturia was exhibited by nine of the 15 children whose urine was examined microscopically (four of these had macroscopically evident hæmaturia).

Anæmia is frequently encountered.

Radiological Findings.

The investigation is largely by radiology. A plain X-ray film of the abdomen shows an opaque mass, sometimes with small and occasionally larger areas of calcification. Films of the lungs demonstrate pulmonary metastases if they are present.

Pyelography, best performed by the intravenous method, never produces a normal picture. The pelvis of the affected kidney may be displaced and distorted, as may the course of the ureter (see Figure IV). Calyces may be compressed or dilated. Rarely the pelvis fails to be visualized.

Retrograde pyelography is indicated only if it is necessary to clinch the diagnosis.

Differential Diagnosis.

Conditions which may be confused with Wilms's tumour are neuroblastoma, hydronephrosis and innocent tumours of the kidney (fibroma, teratoma).

Neuroblastoma of the adrenal gland produces a tumour which is smaller, more fixed and much more irregular both on the surface and in general conformation. It is apt to extend more widely across the mid-line. X-ray examination of the long bones may reveal secondary deposits (uncommon in Wilms's tumour). Pyelography is not of great help, although massive displacement of the renal pelvis is less frequent in neuroblastoma. Extensive calcification in the plain X-ray film is more suggestive of this latter tumour.

Hydronephrosis tends to have a characteristic fluid "feel", and may vary in its degree of tension from time to time. Excretion pyelography may give characteristic

findings, but not infrequently produces no shadow on the side concerned. Retrograde pyelography is diagnostic.

The differential diagnosis from renal fibroma or teratoma will not be made before operation unless, in the latter case, a tooth is visible in the plain X-ray film.

Factors Influencing the Prognosis.

Age.

It is very widely accepted that patients whose treatment is commenced in the first year of life have a much better outlook than others; recovery rates of up to 80% (Gross, 1953) are reported.

Hæmaturia.

Hæmaturia is of very serious significance (Gross, 1953; Scott, 1956).

Handling of the Tumour.

It is possible that frequent examination by doctors and students may help to displace malignant cells into the circulation, and in this connexion Higgins (1949-1950) states that hæmaturia has been known to follow palpation. Once the diagnosis has been made, it is advisable to limit handling of the patient.

Pathological Appearance.

It has been emphasized that the outlook appears to bear no relation to the microscopic appearance of the neoplasm (Gross, 1953). Recoveries may occur in cases with the most anaplastic pictures, whilst well-differentiated growths are often resistant to treatment.

Operation Findings.

The prognosis must be unfavourably affected by the finding at operation that the growth has extended locally beyond the kidney. Nevertheless, it has been shown that radiotherapy is capable of eliminating malignant tissue which has perforce been left behind. One child of the series reported here was known to have tumour tissue left around the inferior *vena cava* and has survived for five years. Rusche (1951) records a patient alive thirteen years later, who had peritoneal involvement at operation.

FIGURE I.

Wilms's tumour, showing "capsule" of compressed renal cortex and peripherally situated kidney.

Treatment.

Initially the treatment consisted of nephrectomy, and Walker (1897) quoted several series of cases in which the operative mortality rate ranged from 44% to 70%. During the early part of the present century, owing to a combination of factors, these figures improved until operative deaths are now infrequent and in some series are conspicuous by their absence. Long-term survivals have consequently greatly increased in number and percentage, and there are numerous well-authenticated cases of five and ten year "cures" as the result of nephrectomy alone.

As the century advanced, radiotherapy entered the therapeutic field and soon demonstrated that it was to become a valuable aid in treatment. All writers on the subject began to emphasize this point (Bothe, 1935; Silver, 1947; Kerr, 1939; Bixler, Stenstrom and Creevy, 1944; Dean, 1937). The two last-mentioned authors have even suggested that nephrectomy might be better omitted. However, although cases of recovery following radiotherapy alone are reported (Kerr, 1939; Nesbit and Adams, 1946), this attitude has found no favour with the great majority of those who are best able to express an opinion. It was shown in 1935 by Bothe that, whereas the sarcomatous elements of the neoplasm were very sensitive to irradiation, the epithelial component was most resistant, and even survived the exhibition of doses of a magnitude so great as to cause the death of the patient. A case reported by Dean (as quoted by Scott, 1956) showed epithelial elements of a Wilms's tumour to be viable in a kidney removed for reasons of infection fourteen years after irradiation. This resistance strongly discourages any therapeutic strategy which omits nephrectomy.

Gross (1953) stated that at the Boston Children's Hospital the advent of post-operative irradiation had advanced the survival rate from 32·2% to 47·3%. Similarly, Scott (1954) held that at the Royal Hospital for Sick Children, Glasgow, an increase in the survival figures from 2·6% to 20% was due to the same agency.

It appears, then, that the case for post-operative irradiation is a strong one.

In considering the place of pre-operative irradiation, it may be pertinent to comment on the fact that many subjects of Wilms's tumour, who reach the surgeon at an age of two or three years apparently free from metastases, show evidence of gross pulmonary dissemination a few weeks after nephrectomy. If there is any truth in the observation of Willis (1953) that a high proportion of these neoplasms are present at birth, it is very apparent that nephrectomy causes a great increase in the activity of neoplastic tissue which had previously been comparatively quiescent for a long period. Were this activation caused by the discharge of malignant emboli, it might be anticipated that the effects of prior irradiation would render this occurrence less likely. Such a theoretical observation seems to be set at nought by Gross (1953), who states that for one year alternate patients at the Boston Children's Hospital were treated with pre-operative irradiation; at the end of this time "it was apparent that the fatality rate was sky-rocketing above former figures" and the practice was discontinued. On the other hand, Silver (1947) and Huguenin *et alii* (1955) quote results which strongly suggest that this addition to the therapeutic panel has favourably influenced the survival rate. Its use is also advocated by Dean (1937), by Bixler, Stenstrom and Creevy (1944), by Harvey (1950) and by Rusche (1951). One of the results of irradiation is a considerable decrease in the size of the renal mass. Although this simplifies the task of the surgeon, one feels that the decision as to whether irradiation is to be used in the pre-operative phase should be taken solely on its effect on the ultimate mortality. Opinion is obviously divided on this matter, and no convincing figures appear to be available.

From the foregoing it can be seen that nephrectomy, if practicable, is almost universally recognized as the hub of the wheel of treatment. In this regard it is widely conceded that the extraperitoneal loin exposure is inadequate.

The transperitoneal approach, through an extensive transverse or vertical incision, gives ample access, allowing the region of the pedicle to be treated first without undue handling of the tumour. One feels that the thoraco-abdominal approach should be avoided on the grounds that it is never necessary in these cases, and serves only to expose a second serous cavity to malignant contamination. Nephrectomy should be followed by irradiation—commenced on the day of operation (Gross, 1953). The position of pre-operative irradiation is still in doubt, although on theoretical grounds there is much to be said in its favour.

The treatment of pulmonary metastases is another debatable point. Secondary growths most commonly develop in the lungs, and regression, permitting survival in good health for periods up to five and a half years, has undoubtedly followed their irradiation (Kerr, 1939; Bixler, Stenstrom and Creevy, 1944; Silver, 1947). It has been suggested (Gross, 1953) that, should pulmonary metastases be few in number, irradiation is indicated, but that a thick sowing in the lung fields does not warrant treatment. One patient in the present series underwent lobectomy for what appeared a localized lung metasasis, only to die a few weeks later with further dissemination in the same organs. This line of attack is not recommended.

Prophylactic irradiation of the lungs has been both suggested and practised. Theoretical arguments similar to those adduced earlier in favour of pre-operative tumour irradiation could be used here. It is conceivable that tissue products, admitted to the circulation at nephrectomy, could activate inert malignant emboli already present in the lungs. If actual secondary deposits can be cured by irradiation without resultant permanent damage to the lung (and this appears to be true—*vide supra*), a prophylactic course of therapy could well be both effective and harmless. There is certainly no unanimity of opinion on this practice, which seems to be used but rarely.

Results of Treatment.

The results of treatment are most diverse, and vary from recovery rates of about 50% (Nesbit and Adams, 1946; Silver, 1947; Gross, 1953) at one end of the scale to our own favourably estimated 11·5% at the other (see Tables II and III). The percentages in these tables must be considered in the knowledge that they are admissible from a statistical point of view.

TABLE II.

Case Series with Recoveries.

Authors.	Year of Publication.	Number of Cases.	Recoveries.	Percentage.
Bixler, Stenstrom and Creevy	1944	13	3	23·0
Nesbit and Adams	1946	16	8	50·0
Silver	1947	18	10	55·0
Rusche	1951	40	12	30·0
Gross, 1940 to 1947—Boston Children's Hospital	1953	38	18	47·3
Scott—Royal Hospital for Sick Children, Edinburgh	1956	51	8	15·4
Royal Children's Hospital, Melbourne, 1945 to 1955	1956	26	3	11·5

In attempting to find reasons for this pronounced divergence, one immediately realizes that the only satisfactory basis of assessment for any series is that of the total number of survivals computed against the total number of affected patients passing through the centre over a given period, no matter whether they were treated or not. Furthermore, only five-year recoveries should be acceptable as "cures". If these criteria are used, some assessed mortality rates are seen in a somewhat less favourable light. However, the figures of Gross (1953) remain unaltered at an overall survival rate of 47·3% in 38 cases encountered during the 1940-1947 period.

The majority of our own patients from 1945 to 1955 were treated along the same general lines—nephrectomy followed by post-operative irradiation (see Table III). The operative mortality rate was 10%; but despite this it does not seem that the poor results can be entirely attributed to the surgeon. Nor do the age groups of the patients suggest that late diagnosis is the cause. Unless the actual type of tumour differs in the two hemispheres (an unlikely event, as judged by the described pathology), it appears possible that an important factor in our high mortality is the technique of the radiotherapy. Although I am not competent to give an opinion about the effective tumour dosage resulting from different techniques, I have discussed the matter with those who are, and it would seem that the dosage in Melbourne may differ little from that used so effectively in Boston. However, there is one point in which there is appreciable divergence in detail. Our patients commenced radiotherapy when the wound was healed; in Boston this therapy is instituted on the operating table with the child still under the anæsthetic administered for nephrectomy. This possible avenue of improvement is one which could well be worth exploring.

TABLE III.

Wilms's Tumour at the Royal Children's Hospital, Melbourne, 1945 to 1955.[1]

Type of Treatment.	Number of Patients.	Alive.	Dead.	Recovery.
Nephrectomy followed by irradiation	17	3	14	17·6%
Irradiation followed by nephrectomy	1	0	1	0
Nephrectomy alone	1	0	1	0
Irradiation alone	2	0	2	0
Excision of bilateral tumours followed by irradiation	1	0	1	0
Explored and found inoperable: no further treatment	4	0	4	0
Total	26	3	23	11·5%

[1] One five-year cure, one two-year "recovery", one fifteen-month "recovery".

The 11·5% recovery rate is calculated reckoning these three cases as "recoveries".

The subject of Wilms's tumour is a fascinating one, to a considerable extent because of the incompatible results obtained by different workers from similar treatment. In seeking a logical explanation of the contradictions one is struck by the point that the factor common to all reported case series is paucity of numbers. Wilms's tumour is an unusual disease; were it as common as acute appendicitis, doubtless all major discrepancies would have been eliminated long since.

As the result of this study it has become apparent that considerable progress has already been made along the highway of treatment, but that this highway has now branched into divergent shadowy tracks. It remains to define the correct route and to build the highway through to its appointed goal.

Summary.

A series of 26 cases of Wilms's tumour is reported, these comprising the total number of patients with the condition admitted to the Royal Children's Hospital, Melbourne, during the period 1945 to 1955.

The question of treatment is discussed in detail in the light of results reported in the literature.

A therapeutic routine is outlined and possible adjuncts to this are indicated.

Some attempt is made to explain the great diversity of results in different series.

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Legends to Illustrations.

FIGURE II.—Wilms's tumour, showing basic small round cells differentiating into (*a*) primitive mesenchyme, (*b*) imperfect tubules, (*c*) an imperfect glomerulus.

FIGURE III.—Wilms's tumour, showing round cells differentiating into smooth muscle.

FIGURE IV.—Excretion pyelogram, showing displacement of renal pelvis and ureter.

Reports of Cases.

A CASE OF MYELOID RETICULOSIS.

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THE literature reveals conflicting views on the origin of the myeloblast. In 1907 Maximow stated that a circulating cell resembling the lymphocyte could, in capillaries, form all cells of the myeloid series. Israëls (1940) denied the validity of this, on the grounds that with the technique used, the various types of primitive blood cells all tended to appear alike and to resemble lymphocytes. In his experience with tissue culture of bone marrow from leuchæmic patients, he found that granulocytes, lymphocytes and monocytes all followed distinct lines of development, with no intermediate forms occurring between them. Robb-Smith (1938) quoted the experimental work of Ehrick (1931), who purported to show that myeloid cells were formed in the germinal centres of the lymph nodes of animals injected with benzol. Downey (1938) expressed the view that myeloblastic cells were derived from primitive reticulum cells. He thought that whilst there was no concrete proof of this, all the facts seemed to point to it as the only logical conclusion.

In view of this assumed, and commonly held, close developmental relationship between the primitive reticulum cell and the myeloblast, the following case is of interest.

Clinical Record.

The patient, a woman aged twenty-five years, was first admitted to hospital in November, 1951. Her illness commenced some two months prior to her admission with excessive fatigue. Later she noticed a vague soreness over her sternum, a rash over her trunk and arms and a tendency to bruise very easily.

When examined she was a well-nourished woman with a sallow complexion. There was a macular rash over her trunk and arms, and several bruises were noticeable on her arms and legs. The liver could be felt one centimetre below the costal margin, and the spleen was just palpable. No enlarged lymph nodes were found. Examination of the cardio-vascular and central nervous systems revealed no abnormality. The blood pressure was 120 millimetres of mercury, systolic, and 60 millimetres, diastolic. The urine was normal, and an X-ray examination of her chest revealed no abnormality. A blood count on November 9 gave the following results: the hæmoglobin value was 9·7 grammes *per centum*; the leucocytes numbered 107,000 per cubic millimetre, the differential leucocyte count being as follows (the figures given being per cubic millimetre): myeloblasts 1070 (2%); neutrophile myelocytes 15,000 (14%); neutrophile cells 80,000 (75%) (young forms 5330 or 5%, band forms 8400 or 9%, segmented cells 65,500 or 61%); eosinophile cells 1070 (1%); lymphocytes 4300 (4%); monocytes 2140 (2%).

On the basis of the white cell count together with the splenomegaly, a diagnosis of chronic myeloid leuchæmia was made. The patient was discharged from hospital on November 17, and referred for radiotherapy as an outpatient. Between November, 1951, and March, 1955, monthly white cell counts were made and deep X-ray therapy was given intermittently to the splenic area. Excellent clinical and hæmatological remissions were obtained initially with a comparatively small dose, but later much larger doses were required. Figure I shows the total white cell counts and the response to splenic irradiation. In all, eight courses were administered. Over that period total white cell counts immediately prior to each course of radiotherapy varied between 60,000 and 240,000 per cubic millimetre. In all these counts there were between 70% and 80% of neutrophile cells and 1% and 4% of myeloblasts. Similar percentages were seen in each of the other very many counts performed, with the exception of two or three isolated counts made soon after a course of radiotherapy. Her symptoms in general ran fairly parallel with the height of the white cell counts.

During March, 1955, she again relapsed, but on this occasion she drew attention to a lump in her right axilla, which, she said, had been present for only a few days. She was readmitted to hospital, and when she was examined there was a firm mass just below the right breast, attached to the ribs. There was a hard lump also in the left breast, and moderately hard lymph nodes were present in both axillæ. The liver was palpable four centimetres below the costal margin and the spleen six centimetres. Pelvic examination revealed tumours in each lateral fornix. It was thought that these masses represented either leuchæmia deposits or widespread secondary carcinoma from the breast. At this stage a node was removed from the right axilla, after which the patient's condition rapidly deteriorated. For several days there was hæmorrhage from the biopsy wound, necessitating several blood transfusions, and a few days before her death she became blind in the right eye and developed multiple skin nodules. She died on April 19, 1955, three years and four mohths after the diagnosis of myeloid leuchæmia had been made.

Autopsy Findings.

At the autopsy there were numerous hard, subcutaneous nodules throughout the body, each about one centimetre in

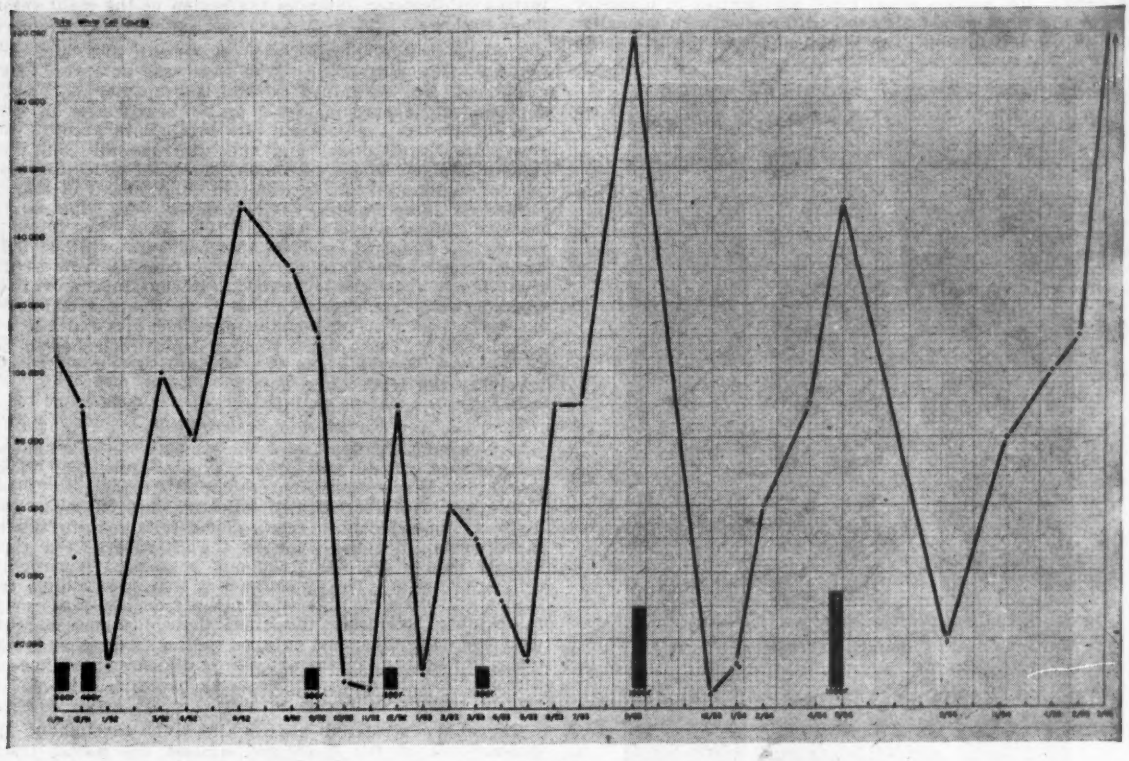

FIGURE I.

The variation is shown in total white cell counts over the period of three years and four months and the response to irradiation. The solid blocks on the base line indicate the dose of deep X-ray therapy directed to the spleen in each course of therapy.

FIGURE II.

Uterus with bilateral ovarian tumours attached.

diameter, and a mass about eight centimetres in diameter under the right breast attached to the ribs, with a smaller one in the left breast. The lymph nodes in the left axilla

FIGURE III.

Longitudinal section of the right femur. The fatty marrow is completely replaced by red marrow. A tumour nodule can be seen in the upper part of the specimen.

and both groins were enlarged, and there was a gaping biopsy wound in the right axilla. There was generalized enlargement of all the mediastinal lymph nodes up to two centimetres in diameter, and numerous small tumours were attached to most ribs. Throughout the lungs many small, rounded tumours were scattered, the largest, three centimetres in diameter, lying in the region of the right interlobar fissure.

The spleen was enlarged (405 grammes), firm, and of a uniform dark red colour. The liver was enlarged (2100 grammes) and contained several subcapsular neoplastic deposits, and a hard mass 1·5 by 2·0 centimetres in area was adherent to the common bile duct. Both kidneys, the small and large bowel and the pancreas all contained tumour nodules. There were many scattered nodes throughout the mesentery, and generalized enlargement of all the paraaortic lymph nodes. Both ovaries were replaced by massive tumour deposits (Figure II). They were 10 centimetres in diameter, and on section were whitish with hæmorrhagic areas throughout. The bone marrow of the right femur only was examined. It contained a whitish tumour two centimetres in diameter in its upper third, but the rest of the shaft was completely filled with red marrow (Figure III). There was a tumour deposit attached to the *dura mater* overlying the left parietal lobe and another involving the right optic nerve.

Microscopic Examination.

The normal architecture of the lymph node is destroyed and replaced by cells of a uniform type (Figure IV). These cells are pale with a distinct eosinophilic cytoplasm. Their nuclei are characteristically indented, and in most, two distinct nucleoli can be seen. Some cells contain two or three nuclei, but none are of the Sternberg-Reed type. Mitotic figures are numerous and occasional neutrophile cells are present. The appearance is that of reticulum cell sarcoma (Figure V). Sections taken from the tumours in the kidney, stomach, intestine, thyroid, bone marrow, pancreas, lung, liver and skin, as well as from other lymph nodes, all show a similar and very uniform appearance. A section from the ovary shows much necrosis, but areas of typical tumour cells can be seen.

There are scattered neutrophile cells throughout the parenchyma of the liver and around the portal tracts (Figure VI). The spleen is very cellular, and Malpighian corpuscles cannot be distinguished. There is proliferation of reticulum cells in the pulp, and many can be recognized as the tumour cells already described (Figure VII). Neutrophile cells are again prominent.

The red bone marrow taken from the mid-shaft of the femur is extremely cellular. Islands of erythropoiesis can be seen amongst sheets of pale proliferating cells many of which are indented and resemble the tumour cells (Figure VIII); neutrophile cells are numerous. With Giemsa's stain it can be seen that the pale cells consist both of blast cells and of cells resembling the tumour cells, the latter predominating, and that the whole of the marrow is infiltrated diffusely with abnormal reticulum cells. In addition, the myeloid-erythroid ratio is greatly increased.

In summary, the microscopic features are those of widespread reticulum cell sarcoma, with the bone marrow, liver and spleen showing the changes of myeloid leuchæmia as well.

Discussion.

On the hæmatological and post-mortem evidence it is thought that the original diagnosis of chronic myeloid leuchæmia must be maintained, and that the findings cannot be accounted for by a leuco-erythroblastic reaction. Likewise, on histological grounds it is considered that the diagnosis of reticulum-cell sarcoma must be accepted also. The diffuseness of the neoplastic process in the lymph nodes without any predilection for the sinuses, and the characteristic cell type, declare this as a multifocal system disease, and on these grounds the diagnosis of anaplastic carcinoma can be eliminated. Robb-Smith (1938) regards reticulum-cell sarcoma as a multifocal proliferation, but states that embolic metastases may occur. The latter point is well illustrated in this case, in which there was obvious terminal blood spread, and one section shows a tumour embolus in a vein.

Beutler (1954) described a case in which a tumour involving testis and groin was removed and microscopically proved to be a reticulum-cell sarcoma. Three

years later acute myeloid leuchæmia developed, and he wondered whether the two conditions were related. In this present case it is thought that the two conditions are related, and that the extensive infiltration of the bone marrow, spleen and liver with cells resembling the tumour cells or abnormal reticulum cells links this case with a series of cases described by Israëls (1951), which he classified as myeloid reticulosis. In each of his cases the condition ran a rapid course, and the bone marrow was infiltrated with large, abnormal reticulum cells. Case VI of his series was of the longest duration—six months; it presented clinically as chronic myeloid leuchæmia with anæmia and hepatosplenomegaly. The white cell count was 13,000 per cubic millimetre with 58% neutrophile cells, 10% metamyelocytes, 9·5% "blasts" and three nucleated red blood cells per 100 white cells. Wilkinson (1955) refers to a similar syndrome, which presents first with localized swellings in the dermis with later involvement of the hæmatopoietic system. Uniform reticulum cells are seen in the dermis and bone marrow, and Wilkinson suggests that a leuchæmic picture or true reticulum-cell sarcoma may later develop.

It is suggested that the case here described represents a diffuse neoplasia of the reticulum cells showing the features of myeloid reticulosis which has differentiated along two lines — namely, myeloid leuchæmia and reticulum-cell sarcoma.

Summary.

A case is reported of chronic myeloid leuchæmia terminating in widespread reticulum-cell sarcoma, in which there was a diffuse infiltration of the marrow with abnormal reticulum cells. It is considered that this is a case of so-called "myeloid reticulosis", and that it supports the contention that myeloblasts derive from primitive reticulum cells.

Acknowledgements.

I would like to thank Professor F. R. Magarey for his continued interest, advice and generous help in the preparation of this paper, Dr. T. M. Greenaway for permission to use the clinical notes, Dr. D. Green for Figure I, and the Department of Illustration, the University of Sydney, for the photographs.

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Legends to Illustrations.

FIGURE IV.—Lymph node. This illustrates the uniform appearance with destruction of normal architecture. (Hæmatoxylin and eosin stain, × 75.)

FIGURE V.—Lymph node, high power. Some nuclei of tumour cells are indented. (Hæmatoxylin and eosin stain, × 600.)

FIGURE VI.—Liver, showing infiltration of portal tract with neutrophile cells. (Hæmatoxylin and eosin stain, × 300.)

FIGURE VII.—Splenic pulp. Many neutrophile cells and cells resembling reticulum cells can be seen. (Hæmatoxylin and eosin stain, × 300.)

FIGURE VIII.—Bone marrow, showing dark erythropoietic cells together with paler cells of abnormal reticulum type with indented nuclei resembling the cells of the tumour. (Giemsa stain, × 600.)

Reviews.

Progress in Radiobiology: Proceedings of the Fourth International Conference on Radiobiology Held in Cambridge on 14th to 17th August, 1955. Edited by Joseph S. Mitchell, Barbara E. Holmes and Cyril L. Smith; 1956. Edinburgh and London: Oliver and Boyd. 9½" × 6", pp. 598, with illustrations. Price: 63s.

THIS book is an account of the proceedings of the Fourth International Conference on Radiobiology held in Cambridge, England, from August 14 to 17, 1955. It is stated in the preface that only papers describing new work have been accepted, and that the papers were edited before publication with the approval of the contributors. Particular emphasis has been laid on the discussion, which also was revised before publication with the approval of the speakers, so far as was possible. The preface further states that an attempt has been made to present a coherent picture of the conference as an account of progress in a number of aspects of radiobiology of contemporary interest. The characteristic themes developed were the importance of human data and the need for continued study of the fundamental basis of the biological action of radiations on living cells without concern for possible practical applications. It was considered that perhaps more than ever before the value of collaboration between investigators trained in a wide range of scientific disciplines was demonstrated as an obvious necessity for progress in this very difficult field of scientific inquiry. In addition to an address of welcome by L. H. Gray and an inaugural paper by Professor F. S. Dainton, of the Department of Physical Chemistry in the University of Leeds, on some aspects of radiation chemistry which are relevant to some radiobiological problems, there are 72 separate papers in this volume. They are grouped into 11 sections, dealing respectively with the effects of radiation upon metabolism and enzymes, the effects of radiation upon substances of biological interest, radiation physics and relative biological efficiency, radiation genetics, the mechanism of chemical protection, relevant studies of spleen, bone marrow and blood, oxygen effects, special subjects, radiobiology of bone, radiation carcinogenesis, and human data. The contributors represent many departments of medicine and the allied sciences.

Mental Health Planning for Social Action. By George S. Stevenson, M.D., Sc.D.; 1956. New York, Toronto, London: McGraw-Hill Book Company, Incorporated. 6" × 9", pp. 369. Price: $6.50.

AT a time when large-scale experimentation is to the fore in many fields of community activity, "Mental Health Planning for Social Action", by Dr. George S. Stevenson, is timely. A psychiatrist with many years' experience in the mental hygiene movement, he provides an authoritative background and writes with lucidity.

Margaret Mead in a foreword refers to the spate of projects and many prophets who have confusing effects on our civilization. The end is committee after committee. In the clash of conflicting interests there are "periods of crisis and choice, the agonies of mergers, and the finality of death as some cherished program then becomes definitely non-viable". She infers that many will wish George Stevenson to join their committee because he has that wisdom which is "a distillation of attention". The evidence of the book supports her contention.

The volume falls naturally into five parts. After a discussion on the basic consideration of mental hygiene, its meaning, range and history, there is a section on restoration of mental health which covers State, local, private and Federal agencies providing for all types of the mentally disordered. Part III concerns public health and prevention. The next section is devoted to elevation of mental health and refers to the influence of the home, the church, the school, military defence services, work and recreation. The last part includes the vital part of the programme execution and social action.

Each section has a bibliography. An appendix includes a helpful list of visual aids obtainable in the United States of America.

It is impossible in a brief review to portray adequately the subject matter. Each page covers a closely reasoned and well-documented account of some special angle of mental hygiene. Contrasting points of view are balanced and the solution bears the impress of common sense. After appreciating this, the reader turns to his own social interest to find helpful comments, whether it be retarded children, family agencies, delinquents, prisons, mental health of the

aged, social rehabilitation, or narcotic addiction. The viewpoints are stimulating.

The author is to be congratulated on his stressing the need for clear thinking in all social activities. As examples may be cited the six criteria useful in arriving at priority of action on a project. One must decide: (i) Is it appropriate? (ii) Is it serious? (iii) Does it involve many people? (iv) Does it affect society significantly? (v) What is the extent of knowledge, equipment, personnel and techniques necessary to attack the problem? (vi) What is the attitude of the professional and lay public, including their readiness to provide support or to obstruct?

Another example is in the assessment of the success to be expected in an enterprise. The most important factors are the load of work to be done and the adequacy of the personnel.

It may be said that such information is elementary, but only the constant reiteration of such basic principles can save us from those costly mistakes and misapplied efforts which are so common in our community.

This book is confidently recommended to all who have an interest in social action and reaction.

Selected Papers of Sir Gordon Holmes. Compiled and edited by F. M. R. Walshe; 1956. London: Macmillan and Company, Limited. 9¾" x 7", pp. 275, with illustrations. Price: 20s.

THE ten papers reprinted in this volume have been selected as representative of the work of the distinguished neurologist, Sir Gordon Holmes. In a bibliography at the end of the volume and dedicated to him "in homage on the occasion of his eightieth birthday" by the guarantors of *Brain* are listed 127 papers from many journals, as well as five books produced by Sir Gordon Holmes. It is pointed out in a preface that, greatly as the guarantors of *Brain* desired it, it has proved at the present time not possible to reprint all of Sir Gordon Holmes's papers in one volume. The selected papers relate to his major contributions to the pathology and symptomatology of cerebellar diseases (four papers), to his physiological and anatomical studies on the cortical representation of vision (four papers), and to his work on visual orientation and attention (two papers). The dedication of this volume to Sir Gordon Holmes differs from the customary *Festschrift*, which consists of writings from the colleagues and pupils of the man honoured. There is much to be said for the aim of those who have produced the present volume, which was, as F. M. R. Walshe expresses it in a laudatory preface, "to let Holmes speak to us again".

The Life of Hugh Owen Thomas. By David Le Vay, M.S. (London), F.R.C.S. (England); 1956. Edinburgh and London: E. and S. Livingstone, Limited. 9" x 6¼", pp. 143, with illustrations. Price: 25s.

THE earliest origins of orthopædic practice go a long way back into the past; and it is even possible that splints were used by a few rationalists in prehistoric times for the relief of pain, the correction of gross deformities and the prevention of permanent disability in cases of fracture involving the long bones. At least, there is positive evidence that splints were commonly employed by the ancient Egyptians nearly five thousand years ago.

In the intervening centuries many talented individuals without any formal medical qualification have tried their hand at the revealing art of bone-setting, and sometimes with rather phenomenal success. In his book about the supposedly eccentric Dr. Thomas, Mr. David Le Vay has an interesting story to tell of the comparatively recent entry of orthodox medical practitioners into a difficult branch of surgery previously dominated by a class of irregularly trained "bone-setters" or "osteopaths".

Even in the prosaic twentieth century the medical profession has no monopoly over the treatment of disordered bones and joints. It is common knowledge that the pseudoscience of osteopathy is still formally recognized in the United States of America, where there are some seven thousand osteopaths legitimately practising their art; and in England a skilful bone-setter, who lacked a medical qualification, was knighted for his services during the first World War as an expert in applying origial manipulative procedures in the treatment of the wounded. This book makes it clear that the early development of modern orthopædic surgery is indebted to unqualified practitioners like the grandfather and father of Hugh Owen Thomas, who used much of their knowledge and techniques in his surgical practice at Liverpool as a duly qualified and registered practitioner under the new *Medical Act* of 1858.

Although his private life was calm and irreproachable, the attitude of Thomas to his professional colleagues may have become warped by an undue sensitivity about his family background of unorthodoxy, and by a superior pose of aloofness adopted by the Royal Colleges and their distinguished representatives in regard to his status as a provincial general practitioner and to his work as a successful orthopædic specialist. No doubt in retaliation for the slights to which he thought himself subjected he flamboyantly publicized his superior methods of treatment, while deploring the persistent ignorance of his professional brethren in regard to the main principles involved in the proper management of pathological bones and joints.

In spite of these temperamental lapses, it is now recognized by most medical historians that the work of Hugh Owen Thomas was of the highest quality, and that he was the actual founder of modern orthopædic surgery.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"Progress Report on Birth Control", by Lella Secor Florence; 1956. London: William Heinemann (Medical Books), Limited. 7½" x 5¼", pp. 260, illustrated with tables. Price: 21s.

Based on a progress report on birth control and survey of patients registered at the Birmingham Family Planning Clinic in 1948.

"Fundamentals of Immunology", by William C. Boyd; Third Edition; 1956. New York and London: Interscience Publishers, Incorporated. 9¾" x 6¼", pp. 790, with illustrations and tables. Price: $10.00.

The second edition was reviewed in this journal in June, 1948.

"Diagnostic Procedures for Virus and Rickettsial Diseases"; Second Edition; 1956. New York City: American Public Health Association. 9¾" x 6¼", pp. 593, with illustrations and tables.

The procedures emphasized are those considered most useful and practicable in diagnosis of the disease entity.

"Canned Foods: An Introduction to Their Microbiology", by J. G. Baumgartner and A. C. Hersom, B.Sc., A.R.I.C.; Fourth Edition; 1956. London: J. and A. Churchill, Limited. 8" x 5¼", pp. 299, with 35 illustrations. Price: 21s.

First published in 1943.

"Structuration dynamique dans la schizophrénie: Contribution à une psychothérapie analytique de l'expérience psychotique du monde", by Gisela Pankow, with a preface by Juliette Favez-Boutonier; 1956. Bern: Veriag Hans Huber. 9" x 6¼", pp. 80, with illustrations.

The author is a psychiatrist in Paris. The preface is by the Professor of Psychology at the Sorbonne.

"Functions of Autonomic Transmitters", by J. Harold Burn, M.D.; The Abramham Flexner Lectures Series Number Thirteen; 1956. Baltimore: The Williams and Wilkins Company (published for Vanderbilt University). Sydney: Angus and Robertson, Limited. 8½" x 5½", pp. 238, with illustrations of figures and tables. Price: 55s.

The author is professor of pharmacology in the University of Oxford.

"Tables of Amino Acids in Foods and Feedingstuffs", by D. Harvey; Commonwealth Bureau of Animal Nutrition, Technical Communication No. 19; 1956. England: Commonwealth Agricultural Bureaux. 9¾" x 7¼", pp. 58. Price: 15s.

Consists entirely of tables as the title indicates.

"Epileptic Seizures: A Correlative Study of Historical, Diagnostic, Therapeutic, Educational and Employment Aspects of Epilepsy", edited by John R. Green, M.D., and Harry F. Steelman, M.D.; 1956. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 9¼" x 6", pp. 177, with illustrations and tables. Price: 55s.

The title is self-explanatory.

The Medical Journal of Australia

SATURDAY, FEBRUARY 16, 1957.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of the article. The abbreviations used for the titles of journals are those adopted by the Quarterly Cumulative Index Medicus. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

THE PROTECTION OF CIVILIAN MEDICAL PERSONS AND INSTALLATIONS IN TIME OF WAR.

In 1864, at an international convention held in Geneva, the leading European powers signed an agreement in which they undertook to respect the persons and property of those tending the sick and wounded in battle. This covered medical officers and those assisting them, ambulances, hospitals and similar medical installations, and also chaplains. Since that time the Geneva Convention has been developed and revised as conditions have changed and has been accepted by most, but not all, of the nations of the world. It has been abused and evaded, it has been mocked by those to whom its spirit means nothing, but by and large the familiar Geneva cross (a red cross on a white ground) has provided an effective cover for the succour of the sick and wounded of all nations for nearly a century. The irony of it is that this protection extends only to medical officers, their assistants and medical installations in military and other service organizations. The civilian doctor, his assistants and civil defence units not under military control are without protection in carrying out their humanitarian duties to the population in time of war. This fact has been verified from a study of the Geneva Convention and from conferences with representatives of the International Committee of the Red Cross, and so the World Medical Association has set out to do something about the anomalous situation. This is in accordance with its objectives "to maintain the honour and protect the interests of the medical profession" and "to assist all peoples of the world to attain the highest possible level of health". Activity in this direction has been going on since 1953, but it achieved practical expression in October, 1956, when the tenth General Assembly of the World Medical Association adopted an emblem to be used by civilian doctors, their assistants and civilian defence units, as well as a Code of Medical Ethics in Time of War. The emblem is a red staff and serpent on a white field. The staff is represented by a vertical line, the serpent by a sinuous line over the vertical line with two undulations on the left side and one undulation on the right side. The Code of Medical Ethics in Time of War is based upon the International Code of Medical Ethics adopted by the General Assembly of the World Medical Association in 1949—as it well may be, for medical ethics in time of war cannot be allowed to differ from medical ethics in time of peace. "The primary duty of the doctor is his professional duty; in performing his professional duty, the doctor's supreme guide is his conscience." The following are some of the provisions of the Code: the primary task of the medical profession is to preserve health and save life; the doctor, in emergencies, must always give the required care impartially and without consideration of sex, race, nationality, religion, political affiliation or any other criterion, and will continue this medical assistance as long as necessary; all treatment given by the doctor must be in the best interest of the patient; scientific knowledge may never be employed to imperil health or destroy life; medical secrecy must be preserved; the privileges and facilities afforded the doctor must never be used for other than professional purposes.

The new medical emblem and the Code of Medical Ethics were recommended by a joint committee made up of representatives of the International Committee of the Red Cross, the International Committee on Military Medicine and Pharmacy and the World Medical Association, with an observer from the World Health Organization. Their adoption by the General Assembly of the World Medical Association was an important step, but much remains to be done. They have yet to be adopted by member associations of the World Medical Association; then legislative enactments will be necessary in each country, followed by recognition at the international level, before the emblem can be expected to provide protection for civilian medical persons and property. The ugly trends of modern war (declared and undeclared) make this protection increasingly important; so it is to be hoped that everything possible will be done to speed up the rather cumbersome machinery leading to international recognition of the emblem and what it signifies.

To the cynic the whole business may, of course, seem a waste of time and effort. Even those who are not prepared to let bitter and disillusioning experiences distort their approach to life know that international agreements can be ignored when they are inconvenient and that ethics can be forced to take second place to expediency. Nevertheless, the Geneva Cross has exerted a powerful influence

in all modern wars, even on nations that did not officially recognize the Geneva Convention. The new emblem of civilian medical activity should command at least as much respect. Moreover, if nothing else is achieved (and surely no one desires the opportunity to test the new emblem under conditions of war), at least we shall have world-wide attention drawn to the basic attitude of medicine and of those to whom the integrity of its practice is committed. There is much talk today about self-interest on the part of the practising medical profession; this is held up, especially by others who are politically interested, as the motive underlying the profession's attitude to national health schemes, standards of registration for medical practice, the place of practising doctors in the administration of medical services and installations, and so on. But, granted that doctors are human beings and heirs to the frailty of human flesh, we may still say confidently that the profession as a whole has its roots deep in principles of honour and service. An important part of the work of the World Medical Association in the short period of its life to date has been to encourage the conscious recognition by the profession of where its roots really lie. Most doctors, even though they may not be disposed to shout the fact at street corners, will feel a certain stirring of their spirit at such thoughts as the following from the Declaration of Geneva of 1949:

> I will practise my profession with conscience and with dignity.
>
> I will not permit considerations of religion, nationality, race, party politics or social standing to intervene between my duty and my patient.
>
> I will maintain the utmost respect for human life, from the time of conception; even under threat, I will not use my medical knowledge contrary to the laws of humanity.

An immediate effect of the official international recognition of the new emblem for use in time of war might well be a reinforcement of the sense of responsibility and dignity among the practitioners and guardians of medicine in time of peace.

Current Comment.

"DELIVER US FROM EVIL."

PROBABLY at no time in the world's history has the problem of refugees been so formidable. The recent world-wide concern about the people of Hungary has served but to highlight the plight of those in many other countries and to trouble the conscience of all men of good-will. Thomas A. Dooley, a young American physician, whilst in the United States Navy, saw the atrocities that can be committed during war. At Haiphong in North Viet-Nam he improvised a medical camp and cared for the natives during the evacuation of North Viet-Nam. "With 600,000 refugees to worry about, he knew no cessation from his own battle against disease and propaganda that taught, among other things, that Americans were monsters who ate their own children." Dooley resigned from the Navy in order to return as a civilian to Laos, where he believes that much can be done. The proceeds of his book, "Deliver Us from Evil", are to be used to help finance the mission which he has organized and of which the stated aims are as follows:

> 1. To give medical care both to the people of the mountains and of the cities through the Minister of Health of the Kingdom.
>
> 2. To illustrate to these people some of the nature, principles and achievements of America, and especially to show them that we are anxious to help them on a person-to-person basis, at the grass root level of diplomacy.

The mission is going to the kingdom of Laos with the approval of the State Department of the United States, the International Cooperation Administration and the Laotian Government. It is to work under the auspices of the International Rescue Committee, and has received a grant from the Research Corporation of New York City. There have also been numerous gifts by private citizens and commercial organizations. Dr. Dooley has been given the rather unusual privilege of writing a guest editorial in *The Journal of the American Medical Association*.[1] This would make interesting and poignant reading for anybody, not only for members of the medical profession. In this place it is possible only to refer to some of the most important points. Dooley begins by describing simply, but dramatically, the meaning of the concepts "freedom" and "liberty" to those who have neither. "Liberty and freedom to those behind the curtain are a pounding, ever-present dream." He refers to the part that may be played by medicine and medical men as an arm of the foreign policy of any nation, and believes that the special service of American medicine lies in foreign lands—primarily as a help, but secondarily as an illustration of the intentions, achievements and policy of America. This he believes will be one of the most effective ways of counteracting the propaganda referred to earlier. One important field of activity for medicine in the under-developed, stricken areas of the world is to aid those who are refugees. The problems confronting a young and inexperienced doctor in a refugee camp are staggering, and so they remain, even when he has long left that work and is back in his own country, no longer young and inexperienced. They fall into two categories—medical problems, usually of an epidemic nature, and sociological problems, often more overwhelming. This is because unless the problems in the second category are solved, at least to some extent, no medicine can be given out and no medical procedure can be undertaken, and nobody will have any faith in the doctor. The medical problems need be mentioned only briefly, as they will be familiar to nearly everybody. They are: (i) the task of feeding in accordance with the tastes of the refugees concerned; (ii) the provision of drinkable water; (iii) disposal problems relating to waste cooking products, human waste products *et cetera;* (iv) burial of the dead without offence to local tradition, in the absence of sufficient cemetery space; (v) immunization against cholera and smallpox. (Dooley wishes that the drug houses would develop one vaccine for the two diseases, a vaccine that would not require refrigeration.) When no electricity, no X-ray facilities, no laboratory, no nurses and no microscope are available, diagnosis often presents very difficult problems. "It looks like the picture, smells like they say it should, has a few of the characteristic signs and symptoms—it must be—I'll treat it as if it was, if the patient is cured in 10 days—I was right." On psychological grounds, no operation should ever be attempted unless it is inevitable. One death from the use of a scalpel, or even weeks after an operation, will produce a situation in which the doctor will have 15,000 people in his camp, not one of whom will allow the doctor to touch him. On the other hand the rapid and easy cure of common skin infections in the Orient may have an amazing propaganda effect on the natives.

The sociological problems present the doctor with a great many more difficulties. In such a place as Indo-China the majority of the people have never seen a white man; they have never seen a physician; they believe that when a child has a swollen abdomen, a palpable spleen and a high fever he dies. The idea that chloroquine may cure this child's malaria is incredible to them. People in refugee camps sincerely believe that death naturally stalks every child. The doctor in a refugee camp has to combat centuries of tradition and custom, which are real and thriving as well as appalling and frustrating. Their high priestess is the grandmother, who is "10 times worse than

[1] *J.A.M.A.*, September 1, 1956.

the most malignant mothers-in-law of America". On the other hand, if she can be won as an ally of the doctor and induced to believe in penicillin, or sometimes even in soap and water, then the rest of the village can be easily convinced. Dooley points out that a doctor wearing a mirror on his head and a stethoscope round his neck may be a terrifying sight even to his own compatriots. He will be much more terrifying to the uninitiated natives of Oriental countries. When to the effect of his dangerous-looking accoutrements is added that of disruptive alien propaganda, suggesting that hypodermic needles will be used for bacteriological warfare, that the DDT employed will render the people sterile, and that the application of soap to a child's scalp will make him feeble-minded, and so forth, the obstacles to be overcome are multiplied many times. Dooley believes that the most successful weapon to be used in this fight is that of human understanding. The doctor must never run out of compassion, he must be persistent in his gentleness, he must grow to love his patients. "With perseverance we can show our nation's policy of aid and God's policy of charity to our brothers." He believes sincerely that a physician has a special calling to implement his country's foreign policy of help to the underdeveloped and threatened communities of the world, through all the organizations which concern themselves with the problem. Some of the ways in which Dooley and his team will carry out their self-appointed task are worthy of mention. They will work entirely through the Laotian Ministry of Health. They plan to set up their camp in a village, make friends with the people, show them Walt Disney films (which have been donated), play with the children, win the confidence of the adults. The next move will be to try to interest the people in the cures that the team possesses for yaws, congenital diseases, malaria, trachoma *et cetera*, and to ask to be allowed to help them. There will be no attempt at indoctrination, and the team members will sincerely try to learn the good characteristics of the people's philosophy of life. "The only aim is 50% medicine and 50% to let them have contact with Americans who want simply to help them." After a week or two in one area the team will go back to the capital, Vientiane, restock, and then leave for another tribe. They have no wish to try to satiate any one group; they want the tribes to want them to return, they want their allegiance, they want the tribes' allegiance to their own central government.

Surely nothing but good can come from this form of peaceful penetration. This is an American contribution to human welfare and to international peace. It is of interest to all those who, in answering the question "Who is my neighbour?", are prepared to include everyone in need, in any part of the world.

THE IMPLICATIONS OF THE CANADIAN SICKNESS SURVEY.

STOCKTAKING in any phase of human activity is valuable, and at the present time when governments are taking more and more interest in the health of the people, it is essential that from time to time systems already in operation should be appraised, so that alterations may be made and improvements incorporated. A nation-wide study of illness in the general population of Canada was carried out during a period of twelve months beginning in the autumn of 1950. The survey was initiated by the Department of National Health and Welfare and carried out by the ten Provincial Departments of Health. Federal funds were made available to the provinces through the National Health Grants Programme. The survey was planned and organized jointly by the Dominion Bureau of Statistics and the Department of National Health and Welfare in consultation with the Provinces. All the Provincial Health Departments cooperated in gathering the information. The data gathered comprised estimates of the incidence and prevalence of illness of all kinds, the amount of medical, nursing and other health care received, and the volume of family expenditures for the various types of health services. The findings are being studied statistically, and papers are being prepared to present and comment on what has been found, and are appearing in the *Canadian Journal of Public Health*. To present in that journal the findings that have already appeared, papers were prepared for publication and read at the first and second Canadian Medical Care Conferences, held in conjunction with the annual meetings of the Canadian Public Health Association at Edmonton in September, 1955, and at Saint John, New Brunswick, in May, 1956. At the Edmonton meeting a symposium on the survey was presented. Two of these papers, with an editorial on the same subject, appear in the issue for September, 1956. The first is by Murray S. Acker and is entitled "How Much Health Service do Canadians Receive?" Acker points out that as new and far-reaching developments in health services are being approached in Canada, legislators and health administrators will find themselves relying to an increasing extent upon sickness survey data for future planning. He considers that possibly the measurements of the greatest practical value will be those concerned with the amount of illness in relation to the volume of health care actually received. It is unnecessary to present Acker's findings in great detail; he has shown them in a number of statistical tables. It will be sufficient to draw attention to his main points. During the survey year only about 40% of the population reported obtaining medical care; moreover, just under 50% of those who had disabling illnesses were reported as having medical care. (A disabling illness is classed as one which requires one day or more off work.) Physicians' calls and visits to a clinic totalled about 1800 per year. There were significant regional differences as well as variations by income group. The national average rate of calls is lower than that obtaining under the conditions of comprehensive prepayment plans in Canada. During the survey year, visits to the doctor by persons who were not ill formed 17% of the total calls, and this can be taken to represent an important element of preventive medical care. The average amount of in-patient hospital care comprised 103 admissions and 1575 days per 1000 during the survey year. This excluded newborn infants. Acker comments that this level is considerably lower than the rates obtaining under comprehensive Province-wide hospital insurance. Provinces having such insurance, who had bed-population ratios higher than the average, had rates of utilization far in excess of those without such hospital insurance and with fewer beds. The survey has shown that national levels of home nursing care and dental care are low and do not in any sense meet the need for such services. It was interesting that only small proportions of the population consulted optometrists for spectacles or attended what are called "sectarian" practitioners for treatment purposes. Sectarian practitioners are exemplified by osteopaths and chiropractors.

In a paper commenting on the Canadian Sickness Survey symposium G. T. Hatcher presents a summary and the implications of the survey. In his first section he discusses the broadening of public health responsibilities and gives a brief historical statement. He believes that this survey heralds the opening of a new era for public health in Canada, with a broadening of its scope, and he expresses the hope that public health workers and the universities that educate them can move with the times to discharge their new obligations. Public health workers must alter their emphasis from the problems of a generation ago to the major problems of the health of the public at the present time. He points out that reliance is beginning to be placed on the scientific study of the problems and the use of epidemiological and statistical methods, rather than on the search for some miraculous cure, based largely on political expediency. However, one immediate result of this new emphasis is that as the needs become apparent from such scientific study, the government will have the gravest of obligations to make the necessary changes to meet them. In his next section on public policy in medical care expenditures, equity and costs, Hatcher refers to the unfortunate disparity between the unmet needs in some groups and the excessive volume of service for others. This he considers to be due to the fact that health insurance does not yet cover all groups in the population. An alternative reason may be that much of the total health

bill is not covered by insurance, but still falls on the family directly. He suggests that further analysis of volume of services and incidence of illness by income, age and rural-urban location may help to clarify the problem and suggest solutions, but further research will be needed. Referring to family expenditure data, Hatcher states that as yet total costs per family for all medical and health expenditures seem rather low. Much more than 4% of the national income could be spent on personal health services without fear of "economic dislocation". Hospital costs are rather less than might have been thought, and when it is remembered that a part of the hospital and physicians' services includes drugs, it is apparent that the data from the survey may even have underestimated the costs of drugs. Hospital insurance is still the only part of family expenditure for health care that is largely prepaid. Even in this the balance is not much better than 50%. Insurance for medical care is also still largely limited to the middle and upper income groups and to the urban areas. More money is still spent in direct payment than in prepayment. Hatcher then refers to a paper by Kohn on the volume of sickness, and asks to what extent house-to-house canvassing reveals actual morbidity, in contrast to morbidity data obtained by multiple screening or by complete medical diagnostic examination of a random sample of the population. Comparing the findings with those of the Commission on Chronic Illness in the United States, Hatcher believes that "episodic" medicine is not really giving an accurate picture of the prevalence of many illnesses. He admits that most illness may be treated symptomatically and that it may not be possible through absence of the necessary medical manpower to undertake more accurate diagnosis. However, he holds that no conclusion should be drawn until much more is known. He believes that in certain of the chronic illnesses in their early stages it may be highly important to have more accurate information than is available from household surveys. Kohn indicated that for morbidity, unlike some of the family health expenditure data, more detailed tabulations would be available on incidence and prevalence according to social characteristics. Hatcher considers that this is probably only a base line on which to develop more intensive studies of special aspects of morbidity. He also thinks that the time may have arrived when those working on the findings should analyse what they are not going to get out of so extensive a study as the Canadian Sickness Survey, and also some of the details which will be needed for the development of sound public health policies, and which can be obtained only from additional studies. Hatcher completes his comments by bringing in the humanitarian consideration of human life. He states that he has always had an uncomfortable feeling that public health was measuring human life and health in money. Obviously, the objective of medical and health services is good health, even if the cost is greater than it would be if some groups in the population were allowed to suffer ill health or premature death. Up to a certain point good health is economically profitable; however, beyond that point there must be no reluctance to pay substantial additional costs, which can be met only through prepayment with government participation as well, if good health is really to be the objective. Hatcher concludes that all the information available from the survey so far suggests that in the future plans must be laid for a higher rate of utilization of most medical and health services, for higher costs, and for the provision of more medical manpower in hospital beds, if the needs revealed by such a study are to be dealt with properly. But since it is impossible to afford everything, and since beyond a certain point the demand for medical and hospital care becomes a demand for luxury service, a great question of public policy arises. This may be stated as follows: to which services, to which diseases, to which groups in the population should priority be given in the planning and provision of health services that are to be assisted by public funds? Only by additional studies can data be discovered to help in the answering of these questions on the basis of scientific knowledge and not of political expediency.

This work which is being carried out in Canada, although of immediate interest in that country, has a far wider application, and all those concerned with the care of the public health—indeed, all medical practitioners who are interested in preventive medicine—would do well to think about these problems.

TWO ENGLISH DOCTORS AND EIGHTEENTH CENTURY FRANCE.

"To travel hopefully", we are told by Robert Louis Stevenson, "is a better thing than to arrive."[1] This healthy attitude of mind was certainly not that of one of two English doctors who travelled in France in the eighteenth century—Tobias George Smollett, one of the early novelists, a dour Scot if ever there was one. Aimé Dupuy has given a brief account of Smollett's wanderings in France and Italy, taken from a book by Albert Babeau published in 1885, and dealing with travels in France from the Renaissance to the Revolution.[2] Dupuy has taken Smollett and Doctor Edward Rigby, who was slightly later in his journey, and contrasted them as people and given some account of what they saw and recorded. It will be remembered that Smollett was born in 1721 and trained as a doctor. He practised as a physician for a while, but failed, and then devoted himself to literature as a profession. What is not generally known is that he was a poet as well as a playwright and one of the early novelists. In spite of his facility of composition, his general information and his talents, his life was one continual struggle for existence, embittered by personal quarrels brought on partly by irritability of temper. His outlook on life was not improved by the death at the age of fifteen years of his only child, a daughter, and he tried to fly from his grief by taking his wife for a tour of France and Italy shortly after the close of the Seven Years War. He published an account of his travels under the title of "Travels through France and Italy" in 1766, and this was the basis of Sterne's "Sentimental Journey". (Sterne, rather wickedly, gave him the pseudonym of "Smelfungus".) Smollett himself had no illusions about his own attitude; he describes how he set out in the following condition: asthmatic, feverish, coughing, spitting, sad and miserable, with a long face, wrinkled and sullen. He set out ill, he arrived ill, everything annoyed him, everything exasperated him, nothing pleased him. There is no point in mentioning in detail all the trivialities about which he complained bitterly in the book which he afterwards wrote. The annoyances began at Dover and Folkestone and continued without interruption for the whole two years. The high cost of travelling was a sore point, and he hated French food and the frequency with which garlic was used. He could not do without his tea and toast in the morning and had no stomach for meals at midday. The means of transport displeased him violently, as did the accepted methods of turning a dishonest penny in that connexion. (Balzac even later refers to the charge for the non-existent supplementary horse which the traveller could not escape.) At Sens, Smollett considered himself the victim of a flagrant injustice; he seized the book of regulations, thrust his long head out of the window of the carriage and proceeded to read at the top of his voice the rule which he thought had been broken, to an aristocratic stranger whom he took for the post-master. The latter listened in astonishment until the postilions of Smollett's carriage whipped up their horses and drove him away. Lacking understanding of people from other countries, he did not like the French. He objected to their vanity, their greed, their fashions and their behaviour. One thing made him very annoyed—he classed the Frenchman as the least discreet and the most cynical person imaginable.

> If you are ill he questions you with more liberty than a doctor, he forces the door of your room, he worries you to death. It is not from charity, for he is incapable of serious feelings. If he is received in your family, he pays court to your wife, your sister or your daughter. If he does not succeed with any of these, he pays his

[1] "Virginibus Puerisque."

[2] *Presse méd.*, November 7 and 17, 1956.

court to your grandmother. Even his friendship is intolerable. He visits you at any hour, he deafens you with his talking, he meddles in your affairs, he gives you his opinion without its being asked.

However, Smollett's dislike of the people did not extend to the beauties of the country, and he admitted that French agriculture was progressing. At the same time he observed that the peasants presented the typical picture of hunger and misery, and for this he blamed the government for its poor financial administration. Apparently he fared no better in Italy than in France, for he gave even harder judgements about what he saw in that country—so much so, that another English writer, Philip Thicknesse, wondered how Smollett managed to return home alive.

The second doctor whose travels are recorded was Edward Rigby. He was forty-two years old, and he came from the vicinity of Norwich, where he had left his wife and daughters. He was a doctor, a physiologist, an economist and an agronomist, equally reputed in each field. According to Babeau, he had combined practice and theory, founded a medical benevolent society at Norwich and published an essay on the production of animal heat. He had farmed the 300 acres of his property at Framingham, he had edited a few papers on agriculture and rural customs, had translated from the French a book on agriculture in Italy, and had paid some attention to the theories of Malthus on population. He was a local magistrate, was interested in the fate of the poor, and by his writings on the workhouses had tried to reform certain abuses. He went to France with an open mind, prepared to observe without prejudice, and he arrived on July 2, 1789, at Calais with three companions. The story of his travels is contained in letters which he wrote to his wife and daughters. He arrived in Paris on July 8, having observed with pleasure on the way the astonishing fertility of the country. He was surprised to find that people everywhere were not down-trodden and oppressed, and that they even appeared happy. He had not expected to find this in a country which was under the government of an absolute monarchy. The nearer he came to Paris, the better were his impressions. He decided that France was a marvellous country, and that travel was not only a pleasure, but the best source of instruction and intellectual improvement and the only means of dispelling prejudices. It will be readily appreciated that by entering Paris on July 8, 1789, Rigby and his companions also entered into history. It is not necessary to follow their adventures, of which they had plenty, and they had some difficulty in getting away. They observed with great interest the storming of the Bastille and the effect which this produced on the people; but things were not so good when heads began to fall. On the way to the Town Hall to try to obtain their passports they stopped at the morgue, where relatives were trying to identify those who had been killed during the fighting.

> We saw one woman at the moment when she discovered her husband or her son. At the sight she uttered the most violent and loudest cry that I have ever heard.

This incident was not exactly calculated to increase their desire to stay in Paris. Finally they got away towards Dijon. Although the Revolution spread all over France they were not detained, and finally they were able to go to Italy. Profiting by the continued goodwill of the populace, Rigby observed particularly the sanitary conditions and social service work in the towns, and was greatly impressed at Dijon with the *Charité* general hospital, which was very different from the *Hôtel-Dieu* in Paris. His description of the *Charité* hospital is worth repeating:

> No establishment of this nature has ever pleased me more; charity and good sense seem to have presided at its construction. It contains 300 beds, all of iron, with sheets and covers of white cotton, as clean as those of a Quaker in Norwich. Nowhere could I discover the slightest unhealthy or disagreeable odour. The wards are very big and are at least 30 feet high. A few are destined for the care of infirm or incurable old people, others are situated apart, for the mentally deranged, and two among them are reserved for foundlings. But what struck me most was a large room for the reception of strangers without resources. There, the tired traveller may find at once a shelter and rest. He is allowed to stay there three days, they give him all that he needs, and if he has no money they give him a little when he leaves.

A few days later Rigby visited the *Hôtel-Dieu* at Lyons and was struck by the difference between this hospital and that at Dijon. At Lyons the hospital contained, no doubt, 1100 beds, but the sheets were not clean, and although the wards were spacious they were very much too full. When he left France, Rigby recorded that he had received impressions which he would never forget. He left it with regret, stating that he was enchanted with the people, whose characteristics were industry, contentment and good sense. He admired the courage and the perseverance of the middle classes, which seemed to him more enlightened than those in England.

Compared with Sterne's impolite pseudonym "Smelfungus", the nickname given by Babeau to Smollett seems very mild—"*le docteur tant pis*". Rigby he characterized as "*le docteur tant mieux*". In view of the political tempest into which he was plunged, it would have been quite possible for Rigby's impressions to be worse than those of Smollett; but he had the happy knack of rising above external circumstances and seeing to the heart of things. Smollett, though trained as a doctor, made practically no medical observations, and it is difficult to see that he could have gained anything at all of value from his journey. The situation has been summed up very neatly in Thomas Fuller's aphorism: "Travel makes a wise man better, but a fool worse."

POST-OPERATIVE WOUND INFECTION.

AN important aspect of the control of post-operative wound infection has been emphasized in a recent report from St. Bartholomew's Hospital, London, by R. A. Shooter, Gerard W. Taylor, George Ellis and Sir James Paterson Ross.[1] An inquiry was initiated as the result of a rise in the incidence of wound infection in the Surgical Professorial Unit of the hospital. The clinical facts suggested that infection was occurring in the operating room, especially since pyrexia, when it occurred, appeared almost immediately after the operation, and most of the infections involved the deep layers of the wound. No breach of surgical technique was detected, and it seemed that airborne bacteria were responsible for the high infection rate of what should have been clean surgical wounds. Samples of the air in the operating room were examined, and an abnormally high content of bacteria was found. The ventilation was then investigated by watching the movements of clouds of titanium chloride smoke. This showed that air was being constantly sucked under the doors into the operating room from the passage outside; and it seemed probable that some of this air had come from the wards. The same types of staphylococci were recovered from the wards, the operating theatre and the passage between the two; so it seemed likely that faulty ventilation was responsible for the infection. The ventilation was therefore modified so that the powerful input stream of pure filtered air supplied by the ventilation system was directed across the operating table and out round the doors. These changes in ventilation were followed by an immediate reduction in the number of bacteria in the air and by a striking fall in the incidence of wound infection (from 9% to 1%). Particular care was taken not to alter any other procedure in the operating theatre, so it seems reasonable to attribute the striking improvement to the changes in ventilation. It is thought that the significant changes were not only the reversal of airflow in the operating room, but also the elimination of the zone of still air previously existing over the operating table. The original plan had been to cause as little disturbance as possible over the surgical team, but it seems that the zone of still air thus deliberately created encouraged the dropping of staphylococcal particles into the wound. The point seems worth bearing in mind when ventilation systems in operating theatres are being designed or reviewed.

[1] *Surg., Gynec. & Obst.*, September, 1956.

Abstracts from Medical Literature.

RADIOLOGY.

Spontaneous Perforation of the Œsophagus.

G. Tilling (*Acta radiol.*, March, 1956) states that spontaneous rupture of the œsophagus constitutes an acute emergency and occurs almost exclusively in connexion with vomiting or defæcation. The patient is shocked, with severe pain in the chest and upper part of the abdomen, but the clinical picture varies according to the site of the lesion and the direction in which the perforation takes place. For example, perforation into the mediastinum may produce local emphysema spreading upwards to the cervical region. The lower end of the œsophagus is seen to have no relation with the right pleura, but lies in close contact with the left. For this reason rupture of the lower end of the œsophagus commonly takes place into the left pleural cavity, whereas the upper parts of the organ more readily perforate into the right. The most significant radiological sign, however, is the presence of hydropneumothorax. When found in a patient with acute severe pain in the thorax and/or upper part of the abdomen, it should always lead to suspicion of rupture of the œsophagus, and examination of the latter should be carried out with a sterile absorbable medium as contrast agent. The differential diagnosis includes perforation of a peptic ulcer, coronary occlusion and pulmonary embolus. Acute cholecystitis and acute pancreatitis should also be excluded.

Plummer-Vinson Syndrome.

C. F. Hutton (*Brit. J. Radiol.*, February, 1956) reports a series of 24 cases of Plummer-Vinson syndrome met with in the course of eight years. He states that this syndrome is a well known clinical condition characterized by dysphagia associated with simple hypochromic anæmia. Other features which may be present include a smooth, often sore tongue, a dry mouth, spoon-shaped brittle nails, angular stomatitis, and symptoms more directly traceable to the anæmia such as listlessness, pallor, œdema of ankles and dyspnœa. The spleen may be enlarged and the erythrocyte sedimentation rate is often raised. Radiologically the characteristic web filling defect in the anterior wall of the pharynx just below the lower border of the cricoid cartilage was recognizable in every patient examined. Although the depth of the indentation was greatest in the anterior wall of the pharynx as seen in lateral projection, it was always recognizable in the postero-anterior projection when the pharynx above was well distended by the bolus. The author states that immediately below the web it is often possible to recognize a short segment of the upper part of the œsophagus, generally about half an inch in length, in which the normal distensibility is limited to a greater or lesser degree. The lower limit of this segment is frequently separated from the normal œsophagus by a secondary constriction. In those cases in which the constricted segment has been well developed dysphagia has been most severe, though the clinical response to treatment has been variable. Satisfactory clinical response is not necessarily followed by the disappearance of the web; in three of the cases under review there was a dramatic clinical improvement though the radiological response was poor. It must be stressed that these patients often regard any marked improvement in their swallowing as a return to normality; they have been conditioned to swallowing very slowly and carefully and have acquired dietetic limitations which have become second nature. Any mitigation of their dysphagia enables their limited diet to be swallowed with relative ease. As an example, a patient may claim to be able to eat meat, but careful interrogation reveals that the meat is always finely minced. In patients with a Plummer-Vinson syndrome there is a high incidence of œsophageal carcinoma, and the condition is generally regarded as precancerous.

Primary Reticulum-Cell Sarcoma of Bone.

E. V. Medill (*J. Fac. Radiol.*, October, 1956) states that primary reticulum-cell sarcoma of bone is an extremely radiosensitive malignant tumour arising from the reticulo-endothelial cells of the bone-marrow in a single focus and capable of regional and distant metastases. The tumour may occur at any age, but is most commonly found before the fourth decade, and there is a predilection for the tubular bones of the lower limb; in 40% of cases the lesion is located about the knee. The most common and constant change is a patchy destruction of the affected bone with an ill-defined boundary. In over 50% of cases there is a simultaneous development of patchy new-bone formation within the involved area giving rise to a mottled appearance. This finding is of considerable importance, as it may occur in the early stages, and its presence should arouse suspicions of reticulum-cell sarcoma. In the long bones the focus almost invariably originates in the medulla and may occur in any portion of the bone. There is, however, a tendency for the lesion to favour the metaphysial regions, but, in keeping with other malignant bone tumours, the epiphyseal line is respected. The synovial membrane is commonly involved, and an effusion may be evident at an early stage. Periosteal new-bone formation is seldom prominent and rarely a presenting feature. When present, the periosteal reaction is of a lamellated type and may be accompanied by a small reactive triangle. Spiculation is an uncommon finding and rarely prominent. The cortex is invariably destroyed to a varying extent, and there is no "ghost" outline of this as may sometimes be observed in osteolytic types of osteogenic sarcoma. The disease progresses relatively slowly, causing much bone destruction, but tending to remain localized for a remarkably long time. Subsequently, however, involvement of the regional lymph glands occurs, and distant metastases may become evident, especially in the skeleton, skin and subcutaneous tissues. The character of the pain should suggest the possibility of a malignant process, and the duration of symptoms may give a guide to the possible nature of the lesion. A history exceeding three months is most unusual in other forms of malignant bone disease and in inflammatory conditions; whereas in reticulum-cell sarcoma of bone it is not uncommon for symptoms to be present for six months or more before advice is sought. The majority of the tumours are extremely sensitive to radiotherapy. The response begins within one to three months, and the affected bone may either show varying degrees of sclerosis or "scar" bone formation or less commonly return to an appearance closely approaching that of the normal.

Agenesis of the Odontoid Process.

E. H. Schultz, junior, R. W. Levy and P. E. Russo (*Radiology*, July, 1956) state that failure of ossification of the odontoid process of the second cervical vertebra is a rare developmental anomaly which may be asymptomatic for many years. As a result of more thorough radiological examinations, the condition has been noted with increasing frequency. The authors report a case of congenital absence of the odontoid process in which neurological changes occurred. The diagnosis was established by radiographic studies, which included laminagraphy and air myelography. Surgical exploration revealed a severe adhesive arachnoiditis with narrowing of the spinal cord at this level. Decompression laminectomy was performed, and subsequent neurological examination showed partial regression of symptoms.

Diabetic Charcot Joints.

J. G. Bolen (*Radiology*, July, 1956) states that a rare complication of *diabetes mellitus* is the production of neuropathic joint changes in the foot. Early descripsions of neuropathic or Charcot joints represented them as pathognomonic of syphilis, but similar findings have been reported in leprosy, peripheral nerve injury, syringomyelia, pyogenic soft-tissue infections following puncture wounds, and other infections secondary to trauma. The process usually begins after several years of poorly regulated diabetes. Early signs and symptoms include relatively painless swelling of the tarso-metatarsal region, with gradual eversion of the foot. The disease progresses slowly to partial or complete necrosis of the tarsal bones and obliteration of their normal joint relationships. Treatment of the joint lesions in diabetes is generally unsatisfactory. The changes, once begun, are slowly progressive in spite of antibiotic therapy and careful diabetic management. No specific treatment is efficacious, although in two instances the condition has been apparently arrested by lumbar sympathectomy; some benefit from immobilization has also been recorded. The ætiology is unknown, but theories regarding the origin of the condition include diminution of blood supply, peripheral neuritis, and extension to bone from a soft-tissue infection.

Idiopathic Coxa Vara in Childhood.

N. Finby, H. G. Jacobson and M. H. Poppel (*Radiology*, July, 1956) have collected a series of 23 cases of idiopathic

coxa vara in childhood. Of these, seven were congenital in origin and 16 developmental. A tabular summary of the clinical data is given. There are two main points of difference between the congenital and developmental groups. In the congenital cases the age of onset is earlier, and there are associated anomalies. These include acetabular dysplasia, femoral shortening and multiple associated abnormalities. The developmental form does not usually occur until after the fourth year, and other anomalies are not seen. In each group the chief radiological features, in addition to the *coxa vara*, are a vertical epiphyseal plate and elevation of the greater trochanter. The characteristic irregularity and fragmentation of the proximal metaphysis are often productive of a loose triangular fragment at the margin of the metaphysis and a short hypoplastic femoral neck. The pathology and pathogenesis of idiopathic *coxa vara* are not clearly known. A tenable hypothesis suggests deficient osteogenesis in the femoral neck region, with development of "pseudarthrosis". The optimum treatment, at present, appears to be a subtrochanteric osteotomy at an early age to promote solidification of the femoral neck with an improved alignment in weight-bearing.

RADIOTHERAPY.

Cancer of the Larynx.

G. SEED AND J. R. NUTTALL (*J. Fac. Radiologists*, October, 1956) discuss the classification and treatment of carcinoma of the larynx. They stress that close cooperation between radiotherapist and laryngologist is essential in the decision that has to be made between surgery and irradiation. They discuss the sites of the disease in relationship to this choice and give their results. The results of treatment of cord lesions were best with 42% survivals. The most distressing sites of lesions were the pyriform fossa and post-cricoid region, palliative results being achieved in only a proportion of cases.

Clinical Observations on Cobalt 60 Therapy.

C. C. BURKELL AND T. A. WATSON (*Am. J. Roentgenol.*, November, 1956) have been using cobalt 60 therapy for some four years. They consider that there is nothing inherently different in cobalt irradiation that will make a radioresistant cancer curable. Consequently, the use of the apparatus has been confined to treating those patients who have radiocurable cancer, preferably deep-seated in location. In the treatment of cancer of the breast, the high depth dose has resulted in apical pneumonitis, which has led to pulmonary fibrosis in a proportion of cases. In the treatment of carcinoma of the larynx, the assumption that more radiation could be delivered to laryngeal cartilages with cobalt 60 has led to high-dose effects, as would be expected from conventional therapy, at high dosages. Wedge-filtered fields are now used at lower dosage. The authors consider that early carcinoma of the antrum should still be treated by means of a central radium source, cobalt therapy being reserved for more advanced cases with destruction of two or more walls of the antrum. Radium is still the treatment of choice for carcinoma of the cervix, and cobalt has been used to give added radiation dose to the lateral pelvic wall. In 21 advanced cases of carcinoma of the bladder, which would have been suitable only for total cystectomy, the patients have been treated with encouraging results; 13 are alive, the longest survival period being two and a half years, and of the eight dead, two died of intercurrent disease and two had no sign of residual tumour *post mortem*.

Adenocarcinoma of the Rectum.

I. G. WILLIAMS AND H. HORWITZ (*Am. J. Roentgenol.*, November, 1956) consider the results of treatment of adenocarcinoma of the rectum by high voltage X rays at Saint Bartholomew's Hospital during the last ten years. They state that 189 patients were treated; 155 of these had advanced or inoperable lesions, and in 34 operative treatment was contraindicated for one reason or another. They consider that complete or partial relief from symptoms due to primary growth may be obtained, and that there is a good chance of avoiding a colostomy and a small, but definite, chance of cure. They do not think that results are due to any difference in biological effects, as compared with conventional medium voltage therapy, but consider that they are due to greater depth dose and more homogeneous irradiation, possible at high voltages.

X-Ray Therapy of Plantar Warts.

R. J. REEVES *et alii* (*Am. J. Roentgenol.*, November, 1956) discuss plantar warts and the results of treatment after twenty-five years' experience of irradiation as the treatment of choice. They now employ 100 kilovolt X rays and usually give a single application of X rays. They stress the importance of never retreating the same area if treatment fails to produce a cure. The average follow-up period was five years. The results were as follows: cured with disappearance of wart, 75%; cured with some callus formation, 14·8%; no effect or recurrence, 9·9%.

Radiosensitive Bone Tumours.

R. C. TUDWAY (*J. Fac. Radiologists*, April, 1956), who has been working in association with the Bristol Bone Tumour Registry, discusses radiosensitivity and radiocurability of bone tumours and then goes on to consider several types of tumour. He draws attention to reticulum-cell sarcoma of bone and the importance of distinguishing between this tumour and Ewing's tumour of bone. He states that the cases in the registry previously labelled Ewing's tumour have been reviewed, and there is considerable evidence for labelling most of the cases of "Ewing's tumour" either as neuroblastoma or as reticulosarcoma, in which many of the reticulosarcomata are found to be multiple tumours which are clinically different from the true case of reticulosarcoma primary in bone at one site only. For the primary type of reticulosarcoma of bone the author considers that irradiation is the proper method of radical treatment and the prognosis is relatively good. Of his patients with this condition, three are alive after six, seven and nine years. He considers that biopsy before treatment is necessary to establish the diagnosis. Malignant synovioma is more responsive than the general group of connective tissue sarcomata; of eight patients treated, four survive, two of these being recurrence-free; these two were treated radically by irradiation alone (one is alive after six and a half years). Osteoclastoma is a fairly sensitive tumour, and the author considers that irradiation is the treatment of choice in most cases. He states that multiple myeloma is the commonest of bone tumours and universally fatal. X-ray therapy is a useful palliative measure, particularly for localized disease and symptoms. The author has used radioactive phosphorus as a logical method of giving generalized treatment to a disease which is generalized and considers that this form of treatment has increased the survival time. Seventeen patients treated with radioactive phosphorus survived for twenty-one months, whereas the average survival time following deep X-ray therapy alone was nine months.

OBSTETRICS AND GYNÆCOLOGY.

Culdoscopy and Infertility.

J. V. KELLY AND J. ROCK (*Am. J. Obst. & Gynec.*, September, 1956) report on 492 culdoscopies performed in the investigation of sterility. They list the following indications for the procedure: (i) failure of the usual diagnostic tests to disclose a satisfactory cause for infertility; (ii) a suspicion of adnexal adhesions based on history, pelvic examination, tubal insufflation (with delayed shoulder pain) or hysterosalpingography with atypical disposal of the opaque medium; (iii) ovulatory failure, as in amenorrhœa, or suggested by temperature charts or endometrial biopsies. Of their series local, spinal or epidural anæsthesia was used in 447 cases (90·8%). There was no morbidity or mortality attributable to anæsthesia. Of the attempts at culdoscopy 417 (84·8%) were successful and 75 (15·2%) failed. The authors state that when an attempted culdoscopy fails, the chances are about three out of four that an exploratory laparotomy will disclose some pelvic abnormality which will explain the failure of penetration of the cul-de-sac. No death resulted from the operation. Rectal perforation occurred in one case and healed spontaneously; in four other cases rectal damage was suspected. Post-culdoscopy emphysema was encountered in one case. In 34·1% of patients thought to be normal, unexpected abnormalities were revealed; only one out of every four patients suffering from infertility had a completely "normal" pelvis at culdoscopy. The causes of the tubo-ovarian adhesions were peritonitis in 104 cases (72·7%), endometriosis in 34 cases (23·8%) and tuberculosis in five cases (3·5%). The chance of pregnancy appears to be doubled if the culdoscope-screened patient with an abnormality undergoes proper surgical treatment. The authors state that possibly many of the 195 patients found to have normal pelvic anatomy would have undergone futile exploratory laparotomy without the screening help of the culdoscope.

British Medical Association News.

SCIENTIFIC.

A MEETING of the Victorian Branch of the British Medical Association was held in the Departments of Physiology and Pharmacology, University of Melbourne, on October 17, 1956. The meeting took the form of a series of demonstrations by members of the staffs of the two departments.

Heart-Lung Preparation.

PROFESSOR E. B. VERNEY showed the heart-lung preparation evolved by the late Professor E. H. Starling. In this preparation the right auricular pressure, the arterial pressure and the volume of the ventricles were recorded continuously; and the volume-responses of the heart to changes in the load of work imposed upon it were shown. Also shown was the increased efficiency of the heart muscle produced by adrenaline in concentrations of the order of 1:10⁹ and by ouabain, the increased efficiency being manifested by a diminution in cardiac volume and by a fall in right auricular pressure secondary to an increased cardiac output. Later the following toxic manifestations of the action of ouabain were seen: ventricular extrasystoles, ventricular tachycardia and finally ventricular fibrillation.

Electrocardiographic Techniques.

DR. E. R. TRETHEWIE demonstrated the electrocardiogram obtained with a micro-tip "electrode" placed inside an individual muscle fibre of the beating toad heart. He described the production of the Einthoven lead I electrocardiogram from this origin, and illustrated in precise terms the derivation of lead II, aVR, aVL and aVF from leads I and III. That showed that those four leads yielded no further information than did leads I and III. Dr. Trethewie discussed the fact that the Wilson leads recorded changes largely in the anterior vertical (frontal) plane, especially V4, V5, V6, and the varying potential of the common terminal. He presented tracings of cardiac infarction from leads A, B, C, which recorded potential differences in three directions (dimensions) with a common origin for the paired points. The completeness of this analysis was indicated by theoretical and practical means, including the demonstration of typical cases of infarction with clinical and standard electrocardiographic confirmation, clinical cases of infarction without standard electrocardiographic confirmation, and clinically unsuspected cases of infarction proven at autopsy. These tracings were selected from 140 cases of cardiac infarction. In all instances the ABC display yielded classical evidence of infarction.

Experimental Valvulitis and Myocarditis.

A case of experimental valvulitis and myocarditis in a calf inoculated with the organism of contagious pleuropneumonia (*Asterococcus mycoides*) was also demonstrated by Dr. Trethewie and Dr. Turner, and implications in relation to joint involvement and rheumatic fever in man were discussed.

"Butazolidin" and Allergic Processes.

Dr. Trethewie finally presented evidence of the inhibition by "Butazolidin" of the release of histamine and SRS (slow-reacting substance) from the anaphylactic lung. The systemic level of "Butazolidin" required to produce that inhibition was shown to correspond with therapeutic blood levels in man in rheumatoid arthritis.

Serum Proteins in Natural and Experimental Nephritis.

DR. D. A. COATS and MISS M. REICH presented serial serum protein estimations in children with acute glomerulonephritis, and with the nephrotic syndrome. It was shown that in acute nephritis there occurred a rapid rise in the γ-globulin level to up to five times the normal concentration. The magnitude of the rise could be correlated with the clinical severity of the disease, and the peak was attained at the point of beginning clinical recovery. The serial observations also afforded an index of prognosis, in that a fairly rapid fall in γ-globulin level after the peak was attained was associated with a better subsequent course than was a level which remained elevated. In cases of subacute nephritis the serial serum protein changes were quite different, the main features being low concentrations of albumin and γ-globulin, and a high concentration of α_2-globulin. The difference in the two patterns could be useful as a differential diagnostic criterion.

Serial serum protein changes were also demonstrated in dogs with Masugi nephritis, together with photomicrographs of their renal lesions. The animals had been followed for varying periods up to two years. The main feature of their protein fraction changes was a rise in the concentrations of both α_2-globulins and γ-globulins. The disease differed both histologically and serologically from the human disease.

Image Cardiography.

MR. D. J. DEWHURST presented a series of six demonstrations. He used an image cardiograph to study the movements of electrical potentials across the chest wall during the cardiac cycle. Twenty-nine chest electrodes were placed in a rectangular array, which was reproduced on a cathode ray tube screen. A high potential at any electrode caused brightening of the corresponding spot on the screen.

Electromyography.

Techniques and some clinical applications of electromyography were next demonstrated. In this method of assessment of muscular disorders a pair of electrodes (contained in a hypodermic needle) were introduced into the muscle under examination, and the electrical action potentials from the motor units in its vicinity were displayed on a cathode ray oscilloscope and recorded on a film for subsequent assessment.

Cardiac Defibrillation.

A demonstration was given of a small portable cardiac defibrillator. Ventricular fibrillation was induced in a dog's heart, the condition was illustrated by the use of an electrocardiograph and arterial pressure recording, and it was then corrected by application of the defibrillator.

An Electronic Tissue Stimulator.

An exhibit showed the steps in development of an electronic tissue stimulator for use in medical research, starting from the formulation of the user's requirements and proceeding through the stages of prototype construction and test to production of the finished unit.

Tissue Thickness Indicator.

An experimental model of an instrument to measure the distance between the various tissue planes in an intact animal was shown in operation. This device emitted very short pulses of sound at regular intervals and indicated the time taken for echoes from the successive planes to return to the transmitter.

Fast Indicating Point Thermometer.

In his last demonstration Mr. Dewhurst pointed out that the introduction of thermistors (minute beads of temperature-sensitive-resistive material) had permitted the construction of simple compact thermometers based on the Wheatstone bridge principle. The instrument demonstrated had been used for skin thermometry, and rectal and œsophageal thermometry during hypothermia, and read from 20° to 45° C. (68° to 113° F.) over a five-inch scale.

Electrical Stimulation of Brain Tissue.

DR. E. M. TRAUTNER and MR. M. MESSER presented a demonstration of electrical stimulation of brain tissue *in vitro*. It was pointed out that isolated brain slices or cell suspensions responded *in vitro* to electrical stimulation with an increase in oxygen uptake, phosphate utilization and other metabolic changes. It was assumed that the metabolism of these cells under the conditions of electrical stimulation was closely related to that of active nerve cells *in vivo*. The apparatus demonstrated was a modification of that used by McIlwain and had been developed in the Physiology Department. The stimulated brain cell was considerably more sensitive to drugs or stress than the unstimulated cell. The response to barbiturate in concentrations approaching therapeutic levels and to changes in the ionic composition of the medium was illustrated.

Lithium.

A second demonstration by Dr. Trautner and Mr. Messer was concerned with the accumulation and excretion of lithium. It was stated that the use of lithium salts for the treatment of states of psychomotor excitation had been advocated in a series of publications during recent years. The difficulty of the therapy consisted in the toxicity of lithium and in the occurrence of cases of grave poisoning. That difficulty could be overcome by a control of the plasma

lithium levels. The urinary excretion, as well as the retention of the ion on prolonged ingestion, and the fluctuations of the plasma lithium levels, were illustrated, and the determination of urinary or plasma lithium concentrations by the flame photometer was demonstrated.

Parotid Secretion and the Effect of Sodium Depletion.

DR. D. A. DENTON demonstrated sheep with permanent unilateral parotid fistulæ. He explained that the fistulæ had been made by a new technique, which represented a considerable advance on the original Pavlov-Glinski preparation. That was because it had been possible to enfold the parotid papilla and terminal three centimetres of duct in a skin flap, so that the saliva dripped from the dependent point of the skin teat. Thus the rate of secretion might be easily observed, without the attachment of any apparatus to the animal, when the sheep was alone or in the company of other sheep. The operative technique had been developed by Professor R. D. Wright.

It was shown that the rate of salivary secretion varied as a result of afferent impulses from a number of receptors; for example, the rate increased when the animal ate, or when acid substances were introduced into the mouth. The rate also increased when the animal ruminated, and when there was eructation of gas from the rumen. It was also shown that the rate of salivary secretion was influenced by distance receptor stimuli; for example, the sight of food or the sight of the usual person who fed the sheep increased the rate of salivary secretion. A sustained increase of secretion was produced by the sight or sound of another sheep eating. Conversely, the rate of secretion was diminished when a dog was brought into the laboratory.

Dr. Denton said that a sheep secreted two to four litres of hypertonic saliva from each parotid gland. The normal sodium:potassium ratio was 180:10, or 18. A sheep with a parotid fistula remained in good condition indefinitely if given enough sodium bicarbonate each day (300 to 600 milliequivalents) to replace that lost from the fistula. If sodium was withdrawn from the animal, the sodium:potassium ratio of the parotid saliva decreased as the animal became depleted of sodium. By the time the animal was depleted of 500 to 800 milliequivalents of sodium the sodium:potassium ratio of the saliva was 30:150, or 0·2. As a result of that remarkable capacity to conserve sodium, the animal might live for weeks in a tolerably good condition with the composition of the saliva constantly altered in the manner indicated.

The Sheep's Salivary Sodium:Potassium Ratio.

DR. I. R. MCDONALD and DR. J. RASCHKE demonstrated a method for modifying the composition of the blood perfusing the parotid gland of a conscious undisturbed sheep. The sheep had a left parotid fistula and left carotid artery loop, so that the saliva could be collected from a stainless steel tray fixed under the animal's head, and solutions could be injected at various rates into the carotid artery for long periods. Two varieties of injecting system were shown—a mercury displacement pump with 0·5 to 1·0 litre capacity, and a motor-driven slow injector apparatus.

It was explained that the sheep could be depleted of sodium by withholding or reducing the daily sodium bicarbonate supplement necessary to offset the loss of sodium in the saliva from the fistula. That caused the salivary sodium:potassium ratio to fall from a normal value of 180:10 to as low as 10:180. Stimulation of the gland by infusing acetyl choline solution at a constant rate into the carotid artery caused an abrupt increase in the salivary sodium:potassium ratio (reaching never more than 25% of normal) coincident with the increase in salivary secretion rate. If a concentrated solution of sodium chloride was injected at a constant rate into the carotid artery, while the acetyl choline infusion continued, the resulting increase in sodium concentration in the blood perfusing the gland caused no further change in the salivary sodium:potassium ratio during the period of injection. If more than 30 millilitres of a 4M sodium chloride solution was injected (120 milliequivalents of sodium ion) the salivary sodium:potassium ratio rose progressively towards normal, after a latent period of one to two hours—the amount of rise being roughly proportional to the change in sodium balance. This response to sodium chloride injection was probably due to inhibition of adrenal cortical secretion. Charts of experiments were shown, which indicated that the effect of removal of the adrenal glands was similar to that of sodium chloride injection, that injection of DOC caused a fall in the salivary sodium:potassium ratio, and that various factors, such as anæsthesia and emotional disturbance, might prevent that adrenal inhibition.

The Adrenal Cortex and the Sheep's Salivary Sodium:Potassium Ratio.

DR. J. R. GODING demonstrated that DOCA administration caused a fall in sodium:potassium ratio in the normal sheep. It was pointed out that adrenalectomized sheep with unilateral parotid fistulæ could be maintained indefinitely in good condition provided they were given 25 milligrammes of cortisone and five milligrammes of DOCA intramuscularly per day, and that the fistula loss of sodium was replaced. Adrenal insufficiency was caused by withdrawal of hormone supplement, while the sheep was receiving standard diet with sodium replacement. That resulted in a large sodium deficit (136 to 480 milliequivalents) owing to renal loss of sodium. The sodium:potassium ratio of the saliva did not show the usual fall: in fact, it rose. The animals were very sensitive to withdrawal of hormones, adrenal insufficiency becoming critical within three or four days. While the sheep was on a maintenance dosage of DOCA and cortisone, sodium depletion was produced by withholding the daily sodium supplement. Although sodium deficits of 200 to 300 milliequivalents were thus produced, there was no change in the sodium:potassium ratio of the saliva.

Adrenalectomized sheep were given DOCA in excess of maintenance dosage (20 to 40 milligrammes per day). The sodium:potassium ratio of the saliva fell for one or two days, then remained constant, even though DOCA administration was continued for ten days. After the sheep had been maintained on high daily DOCA dosage for four to ten days, its daily sodium supplement was withdrawn, and the large DOCA dosage continued. Sodium deficits of 400 to 700 milliequivalents were thus produced, and the sodium:potassium ratio of the saliva fell just as in the normal sheep. Hence the adrenal hormones were shown to influence the sodium:potassium ratio of the sheep's parotid saliva, and it was necessary for them to be present in amounts in excess of maintenance dosage for that ratio to fall normally during sodium depletion. However, as that change occurred normally in the adrenalectomized sheep on constant, but increased, DOCA dosage, the adrenal cortex could not be the sole regulator of the change in sodium:potassium ratio of the parotid saliva seen in sodium depletion.

In an endeavour to evaluate the phenomenon, a further preparation was devised. In that, sheep with unilateral parotid fistulæ were adrenalectomized on the right side. On the left side all adrenal cortical arteries were divided except that arising from the renal artery. The left adrenal was further cleared, so that its sole attachments were to the renal vein, by the hilar adrenal vein, and to the renal artery as previously explained. The renal artery and vein were then divided at either end and the renal ends of both ligated. The other ends were then anastomosed end-to-side to the previously prepared carotid artery and jugular vein respectively. The left adrenal gland and associated vessels were then enclosed in a tube of skin in the neck. Two such animals had been prepared several months previously, one being on display at the meeting. The animals were in good condition and needed no hormone maintenance. A graph was displayed, showing that sodium depletion caused similar changes in salivary sodium:potassium ratio as occurred in normal sheep.

It was intended to use the preparation in two ways: (*a*) The sodium concentration of arterial blood perfusing the gland would be varied by infusing solutions of different sodium concentrations into the carotid artery caudal to the gland, with the artery cranial to the gland clamped. Changes, if any, in parotid salivary sodium:potassium ratio would be observed. (*b*) Blood from the adrenal gland would be obtained from the jugular vein. If that was drawn off completely, a temporary state of adrenalectomy could be produced and the resulting changes in parotid saliva observed. Alternatively, preparations had been made for assay of salt-retaining hormone in the blood so obtained from the adrenal vein of sheep in differing states of sodium balance.

Investigation of Hormonal Effects by Local Long-Term Injections.

DR. S. ROSE and MR. J. NELSON demonstrated a new micro-injector technique. The details of construction and use of the injector had been previously described in an article by Rose and Nelson in *The Australian Journal of Experimental Biology and Medical Science*, August, 1955. The following were the essential features of the technique: (*a*) The injector could be buried subcutaneously in most animals (Dr. Rose and Mr. Nelson used the rat) and was carried about by the animals without apparent deterioration in their health. (*b*) It could deliver drugs at a relatively constant rate for many weeks. (*c*) The drugs might be given directly to any

desired site via a previously implanted tube. (*d*) If a suitable dose of drug was chosen, it might be possible to produce a prolonged local pharmacological action in one area of the body—for example, the *pars distalis*—without an appreciable effect on the general metabolic status.

The technique had been applied to the study of the control of the *pars distalis*. Two main approaches were demonstrated: (*a*) Infusion of blocking drug and target gland hormones directly into the intact pituitary *in situ*. It had been shown that procaine and yohimbine could block the release of thyroid-stimulating hormone from the pituitary. It had also been shown that hydrocortisone and œstrogen acted at the pituitary to inhibit ACTH and luteinizing hormone production respectively. (*b*) Infusion of neurohumoral transmitters into the posterior chamber of the eye. Donor pituitaries from baby rats had been transplanted into the anterior chamber of the eye, and they therefore received a continuous supply of the neurohumoral transmitter. The recipient rats had then been hypophysectomized, and various indices of the function of the transplanted perfused pituitary had been measured. Preliminary data had been obtained to indicate that acetyl-choline was the transmitter for the production and release of follicle-stimulating hormone. Photomicrographs were demonstrated of histological sections of acetyl-choline perfused and non-perfused pituitaries. (The histological examinations and preparation of photomicrographs had been carried out by Miss H. Wischusen by the courtesy of Dr. R. Maynard, of Heidelberg Repatriation Hospital.) In some sections of pituitaries perfused with acetyl-choline follicle-stimulating hormone gonadotraphs could readily be seen. Those cells were not seen in unperfused glands.

Growth and Continuous Perfusion of Cancer Tissues.

DR. T. R. BRADLEY demonstrated a "Perspex" chamber with two compartments, one above the other and each approximately 1·5 centimetres in diameter and 0·5 millimetre in depth, which had been developed with the object of observing the effects of local continuous application of various substances to growing tumour tissues. The lower compartment was a reservoir for the substance to be administered and was separated from the upper compartment by a membrane filter disk. A tumour mash in serum was placed in the upper compartment, the upper boundary of which was a stainless steel gauze disk with an average pore size of 50μ.

The chamber was placed in the peritoneal cavity of the animal, where vascularization of the tumour tissue took place through the steel gauze. Perfusion of the tumour tissue was accomplished by means of the continuous pump devised by Rose and Nelson, situated subcutaneously and connected to the reservoir compartment of the chamber.

Satisfactory growth of transplantable Walker 256 tissue had been observed in such chambers implanted into rats.

The Mode of Action of Penicillin.

DR. A. SHULMAN described an investigation of the mode of action of penicillin. He said that the work, carried out in collaboration with Miss M. Dick and Dr. K. T. H. Farrer, of Kraft Foods, Limited (Victoria), had indicated that penicillin might enter into the thiamine metabolism of the thiamine-deficient rat and the thiamine-dependent mould, *Phycomyces blakesleeanus*.

In the former case, rats given thrice-daily intraperitoneal injections of penicillin had been maintained in good condition on a thiamine-free diet for nine weeks, whereas rats not receiving penicillin were clearly thiamine-deficient in three weeks and were all dead in five weeks. Further, the signs of severe and even terminal thiamine deficiency (convulsions) had been relieved by analogous administration of penicillin.

The mould, *Phycomyces blakesleeanus*, which would not grow on an artificial medium in the absence of thiamine or its thiazole fragment (4-methyl-5-hydroxy-ethyl thiazole), would, however, grow well in the presence of added penicillin. The possible conversion of penicillin to a biologically active thiazole compound both by the rat and by the mould might underlie that action of penicillin.

The Mode of Action of Curariform Drugs.

Dr. Shulman also described an investigation of the mode of action of curariform drugs. He said that numerous and varied synthetic drugs had been produced in an endeavour to elucidate the mechanism underlying curariform activity. Although they had marked differences in chemical structure, the drugs all possessed at least one or two strongly ionizable groups, particularly of the quaternary ammonium type—for example, $N^+(CH_3)_3$-(CH_2)-$N^+(CH_3)_3$ (decamethonium).

Complex inorganic cations—for example, $[Co(NH_3)_6]^{+++}$ cobalt hexamine ion, $[Ru(phen)_3]^{++}$ tris, 1:10 phenanthroline ruthenium II ion, synthesized by Dr. F. P. Dwyer and Dr. E. C. Gyarfas, of the Department of Chemistry, University of Sydney—had been employed in the investigation in an attempt to reduce the problem to a more basic level. Those substances, which passed unchanged through the body and with simple and predictable physico-chemical properties, had exhibited activity indistinguishable from that of *d*-tubocurarine in both the intact animal and the isolated nerve-muscle preparations employed for the pharmacological assay of curariform drugs.

The use of those substances had established that such physico-chemical properties as peripheral charge, stereoisomeric configuration and a differential ability of the drug to adsorb on to and possibly penetrate biological surfaces appeared all to be fundamental in the ability of curariform drugs to block transmission in junctional tissue.

Amiphenazole.

The first of three demonstrations presented by Professor F. H. Shaw and members of the Department of Pharmacology concerned the action of the partial morphine antagonist, amiphenazole. The demonstration consisted of a series of posters giving the pharmacology and therapeutics of the substance, which had been used in the treatment of intractable pain associated with terminal carcinoma, for post-operative analgesia, to prevent neo-natal asphyxia when the mother had been given morphine, and by injection into the umbilical vein to alleviate neo-natal asphyxia.

In the demonstration two dogs had been narcotized with morphine, and remained so during the evening. Two other dogs had been similarly narcotized, but had received amiphenazole, and were bright and alert.

Barbiturate Antagonism.

A series of posters depicted the pharmacology and therapeutics of bemegride, as it was used in the treatment of barbiturate poisoning (400 cases), for the shortening of thiopentone anæsthesia and as a provocative test for epilepsy.

The demonstration consisted of two series of ten rats each. Both had received a lethal dose of pentobarbitone. One series was left as a control, and all animals died. The second received bemebride, remained alive, and gradually recovered consciousness during the evening.

A Long-Acting Hyoscine Ester.

Posters depicted the action of the propionyl ester of hyoscine. The compound had all the therapeutic actions of hyoscine, but was of longer duration, and without the marked side effects of dry mouth, loss of accommodation, headache *et cetera*. The preparation was used as a motion sickness remedy.

Medical Practice.

NATIONAL HEALTH ACT, 1953-1956—PART VI: REGISTRATION OF ORGANIZATION.

THE following list of organizations registered under Section 73 of the *National Health Act*, 1953-1956, is published in the *Commonwealth of Australia Gazette*, No. 2, of January 10, 1957:

Medical Benefits.

New South Wales.—The Manchester Unity Independent Order of Oddfellows Friendly Society in New South Wales, Sydney; Australasian Holy Catholic Guild of St. Mary and St. Joseph Friendly Benefits Society, Sydney; Protestant Alliance Friendly Society of Australasia, Grand Council of New South Wales, Sydney; The Grand United Order of Oddfellows Friendly Society of New South Wales, Sydney; Medical Benefits Fund of Australia, Limited, Sydney; National Independent Order of Oddfellows, Sydney; The Newcastle and Suburban Cooperative Society, Limited, Newcastle; United Ancient Order of Druids, Registered Friendly Society, Grand Lodge of New South Wales, Sydney; The Phoenix Welfare Association, Limited, Newcastle; Irish Australian Foresters' Catholic Benefit Society, Sydney; Independent Order of Odd Fellows of the State of New South Wales, Sydney; The Hunter Medical Benefit Fund, Limited, Cessnock; Newcastle Industrial Benefits, Limited, Newcastle; New South Wales District, No. 85, Independent Order of Rechabites, Salford Unity, Friendly Society, Sydney; C.R.M.

Hospital and Medical Club, Port Kembla; Commonwealth Bank Health Society, Sydney; Mechanics' Medical Assurance Scheme, Newcastle; Northern District Miners' Medical Fund, Newcastle; Ancient Order of Foresters Friendly Society in New South Wales, Sydney; Hibernian-Australasian Catholic Benefit Society of New South Wales, Sydney; South Coast Medical Benefits Fund, Wollongong; The Employees of the Australian Chilling and Freezing Company, Limited, Medical Benefits Scheme, Aberdeen; New South Wales Teachers' Federation Health Society, Sydney; Western District Mineworkers Medical Benefits Fund, Lithgow; The Commercial Banking Company Health Society, Sydney; M.M. Hospital and Medical Club, Port Kembla.

Victoria.—Australian Natives' Association, Melbourne; The Manchester Unity Independent Order of Oddfellows in Victoria Friendly Society, Melbourne; Latrobe Valley Hospitals and Health Services Association, Morwell; Mildura District Hospital and Medical Fund, Mildura; The Hospital Benefits Association of Victoria, Melbourne; Hibernian-Australasian Catholic Benefit Society, Victoria District, No. 1, Melbourne; The Ancient Order of Foresters, in Victoria, Friendly Society, Melbourne; United Ancient Order of Druids, Grand Lodge of Australia, Melbourne; Australasian Women's Association, Melbourne; Protestant Alliance Friendly Society of Australasia, Grand Council of Victoria, Melbourne; The Victorian District, No. 82, of the Independent Order of Rechabites Friendly Society, Melbourne; Irish National Foresters' Benefit Society, Melbourne; Grand United Order of Oddfellows, Melbourne; Independent Order of Oddfellows of Victoria, Melbourne; The Yallourn Medical and Hospital Society, Yellourn; Army Health Benefits Society, Melbourne; The Mutual Benefit Society of the Employees of the Melbourne and Metropolitan Tramways Board, Melbourne; South Western District Hospital Benefits Fund, Warrnambool; Grand United Order of Free Gardeners of Australasia, Melbourne; The Geelong and District Contributory Association for Public and Private Hospitals, Geelong; The Kiewa Works Medical Society, Mount Beauty; Naval Health Benefits Society, Melbourne.

Queensland.—United Brisbane District of the Ancient Order of Foresters' Friendly Society, Brisbane; Protestant Alliance Friendly Society of Australasia, in Queensland, Brisbane; The Grand United Order of Odd Fellows, Queensland, Brisbane; The Queensland District, No. 87, Independent Order of Rechabites Friendly Society, Brisbane; Hibernian-Australasian Catholic Benefit Society, Southern Queensland District, No. 5, Brisbane; The Queensland Branch of the Manchester Unity Independent Order of Oddfellows Friendly Society, Brisbane.

South Australia.—The Whyalla Hospital (Incorporated), Whyalla; Hibernian-Australasian Catholic Benefit Society, Adelaide District, No. 7, Adelaide; The Albert District, No. 83, Independent Order of Rechabites, Salford Unity, Adelaide; The South Australian District, No. 81, Independent Order of Rechabites Friendly Society, Adelaide; National Health Services Association of South Australia, Adelaide; The Mutual Hospital Association, Limited, Adelaide; South Australian Police Department Employees' Hospital Fund, Adelaide; Manchester Unity Independent Order of Oddfellows Friendly Society in South Australia, Adelaide; Commonwealth Railways Medical and Provident Fund, Port Augusta.

Western Australia.—The Hospitals Benefit Fund of Western Australia, Incorporated, Perth; Friendly Societies Health Services, Perth; Goldfields Medical Fund, Boulder; Warren Medical and Hospital Fund, Manjimup; Yarloop District Medical and Hospital Fund, Yarloop; Pemberton Medical Accident and Hospital Fund, Pemberton; Collie Combined Unions Medical Benefits Fund, Collie; Norseman District Hospital and Medical Fund, Norseman; W.A.G.R. Employees' Hospital and Medical Benefits Fund, Inc., Perth.

Tasmania.—The United Ancient Order of Druids' Friendly Society, Grand Lodge of Tasmania, Launceston; The Tasmanian Government Insurance Office, Hobart; United Friendly Societies Medical and Hospital Benefit Association, Hobart; The Independent Order of Odd Fellows of Tasmania, Grand Lodge, Launceston; Electrolytic Zinc Employees' Medical Union, Hobart; St. Luke's Medical and Hospital Benefit Association, Launceston; Patons and Baldwins Employees' Medical Benefit Association, Launceston; The Queenstown Medical Union Hospital and Medical Benefits Fund, Queenstown; Associated Pulp and Paper Makers' Council Medical Benefits Fund, Burnie; The Rosebery Hospital and Medical Benefits Society, Rosebery.

Hospital Benefits.

New South Wales.—New South Wales Railway, Tramway, Motor Omnibus and Road Transport Employees' Hospital Fund, Sydney; The Hospitals Contribution Fund of New South Wales, Sydney; The Grand United Order of Oddfellows Friendly Society of New South Wales, Sydney; Commonwealth Bank Health Society, Sydney; The Manchester Unity Independent Order of Oddfellows Friendly Society in New South Wales, Sydney; Australasian Holy Catholic Guild of St. Mary and St. Joseph Registered Friendly Benefit Society, Sydney; The Sydney Morning Herald Hospital Fund, Sydney; Medical Benefits Fund of Australia, Limited, Sydney; Newcastle Industrial Benefits, Limited; Clerical Fund of the Archdiocese of Sydney and of the Diocese of Wollongong Hospitalization Scheme, Sydney; The Cessnock District Hospital In-Patients' Contribution Fund; The Hunter Medical Benefit Fund, Limited, Cessnock; The Newcastle and Suburban Cooperative Society's Hospital Contribution Fund; The Kurri District Hospital Contribution Fund; Bulli District Hospital Contribution Fund; The Phoenix Welfare Association, Limited, Newcastle; Wollongong District Hospital Contribution Fund; Wallsend District Hospital In-Patients' Contribution Fund; The Illawarra Cottage Hospital, Coledale, Patients' Contribution Fund, Coledale; Protestant Alliance Friendly Society of Australasia, Grand Council of New South Wales, Sydney; C.R.M. Hospital and Medical Club, Port Kembla; United Ancient Order of Druids, Registered Friendly Society, Grand Lodge of New South Wales, Sydney; Independent Order of Odd Fellows of the State of New South Wales, Sydney; The Universal Hospital Fund, Sydney; Broken Hill and District Hospital Contribution Fund; Mechanics' Medical Assurance Scheme, Newcastle; New South Wales Teachers' Federation Health Society, Sydney; The Commercial Banking Company Health Society, Sydney; M.M. Hospital and Medical Club, Port Kembla.

Victoria.—The Hospital Benefits Association of Victoria, Melbourne; Protestant Alliance Friendly Society of Australasia, Grand Council of Victoria, Melbourne; R. S. and S. Mills Employees Hospital Fund, Geelong; The Manchester Unity Independent Order of Oddfellows in Victoria Friendly Society, Melbourne; Hibernian-Australasian Catholic Benefit Society, Victoria District, No. 1, Melbourne; South Western District Hospital Benefits Fund, Warrnambool; Grand United Order of Oddfellows, Melbourne; Australian Natives Association, Melbourne; Seymour Hospital Benefit Scheme; Mildura District Hospital and Medical Fund; Latrobe Valley Hospitals and Health Services Association, Morwell; United Ancient Order of Druids, Grand Lodge of Australia, Melbourne; The Victoria District, No. 82, of the Independent Order of Rechabites Friendly Society, Melbourne; Diamond Valley Community Hospital, Greensborough; The Altona Community Hospital; Independent Order of Oddfellows of Victoria, Melbourne; The Geelong and District Contributory Associations for Public and Private Hospitals; Hastings and District Bush Nursing Hospital; The Yackandandah Bush Nursing Hospital; The Order of the Sons of Temperance National Division Friendly Society, Melbourne; The Kiewa Works Medical Society, Mount Beauty; Cheetham Hospital Benefits Fund, Geelong; Broadford Bush Nursing Hospital; Heyfield and District Bush Nursing Hospital; Hopetoun and District Bush Nursing Hospital; The Korong Bush Nursing Hospital; Nagambie Centre V.B.N.A.; Murchison Bush Nursing Hospital; The Natimuk Bush Nursing Hospital; The Neerim District Soldiers' Memorial Hospital; Pakenham Bush Nursing Hospital; Rupanyup and District Bush Nursing Hospital; Sea Lake Bush Nursing Hospital; Tongala Bush Nursing Memorial Hospital; The Toora Bush Nursing Hospital; Trentham Bush Nursing Hospital; Violet Town Bush Nursing Hospital; "Warley" Bush Nursing Hospital, Cowes, Phillip Island; The Mutual Benefit Society of the Employees of the Melbourne and Metropolitan Tramways Board, Melbourne; Hospital Benefits Fund, Red Cliffs; Valley Worsted Mills Hospital and Sick Benefit Fund, Geelong; Rutherglen District Hospital; Sunshine and District Community Hospital; Kerang and District Hospital Contributory Fund; The Ancient Order of Foresters, in Victoria, Friendly Society, Melbourne; Murrayville Bush Nursing Hospital; Upper Yarra Bush Nursing Hospital; Irish National Foresters' Benefit Society, Melbourne; Wonthaggi and District Hospital Benefit Fund; The William Angliss Hospital Contributory Benefit Association, Upper Fern Tree Gully; Eildon and District Community Hospital; Grand United Order of Free Gardeners of Australasia, Melbourne; Army Health Benefits Society, Melbourne; Naval Health Benefits Society, Melbourne.

Queensland. — Hibernian-Australasian Catholic Benefit Society, Southern Queensland District, No. 5, Brisbane; The Queensland Branch of the Manchester Unity Independent Order of Oddfellows Friendly Society, Brisbane.

South Australia.—The Mutual Hospital Association, Limited, Adelaide; Manchester Unity Independent Order of

Oddfellows Friendly Society in South Australia, Adelaide; Hibernian Australasian Catholic Benefit Society, Adelaide District, No. 7, Adelaide; South Australian Railways Employees' Hospital Fund, Adelaide; The Albert District, No. 83, Independent Order of Rechabites, Salford Unity, Adelaide; The South Australian District, No. 81, Independent Order of Rechabites Friendly Society, Adelaide; The Whyalla Hospital (Incorporated); South Australian Police Department Employees' Hospital Fund, Adelaide; South Australian Public Service Association Hospital Fund, Adelaide; The Eden Fund, Minlaton; The Advertiser Provident Society, Adelaide; Abattoirs Sick, Accident and Hospital Benefit Fund; National Health Services Association of South Australia, Adelaide; Lobethal and District Hospital Association, incorporated; Commonwealth Railways Medical and Provident Fund, Port Augusta.

Western Australia.—The Hospitals Benefits Fund of Western Australia, Incorporated, Perth; Friendly Societies Health Services, Perth; West Australian Railway and Tramway Hospital Fund, Perth; United Friendly Societies' Voluntary Hospital Fund, Perth; Hawthorn Lodge, No. 318, United Ancient Order of Druids, Nedlands; Kalgoorlie Lodge, No. 331, United Ancient Order of Druids, Kalgoorlie; Yarloop District Medical and Hospital Fund; Collie Combined Unions Hospital Benefit Fund; Warren Medical and Hospital Fund, Manjimup; Norseman District Hospital and Medical Fund; Pemberton Medical Accident and Hospital Fund; W.A.G.R. Employees' Hospital and Medical Benefits Fund, Inc., Perth; Goldfields Medical Fund, Boulder.

Tasmania.—The United Ancient Order of Druids' Friendly Society, Grand Lodge of Tasmania, Launceston; Electrolytic Zinc Employees' Hospital Fund, Hobart; Patons and Baldwins Employees' Hospital Benefit Fund, Launceston; The Tasmanian Government Insurance Office, Hobart; St. Luke's Medical and Hospital Benefit Association, Launceston; The Rosebery Hospital and Medical Benefits Society; Associated Pulp and Paper Makers' Council Hospital Benefits Fund, Burnie; The Queenstown Medical Union Hospital and Medical Benefits Fund; The Independent Order of Odd Fellows of Tasmania, Grand Lodge, Hobart; United Friendly Societies Medical and Hospital Benefits Association, Hobart.

Out of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

REPORT OF THE BENEVOLENT ASYLUM FOR YEAR ENDING JUNE 30, 1846.[1]

[From the *Australian Medical Journal*, January 1, 1847.]

APPENDED to the report is a document purporting to be "a list of the principal diseases which have received medical treatment in the house during the year". This list we are informed is the joint production of the house surgeon and the clerk. For all that appears it might almost as likely be drawn up by some old woman—one of those beldames known within the bills of mortality of London before the passing of the "Registration Act" as "Searchers". The arrangement is alphabetical with in more places than one, the descriptive adjective placed first—as for instance "Lacerated wound in the axilla by a bullock".

How to designate the attempt at Classification and Nomenclature we are completely puzzled. It appears to be a jumble of every known system of Nosology eked out with the "Searcher" aforesaid with a total disregard of Lindley Murray. We have for example "Spasms in the Stomach", "Cataract of the Eye" and "Cataract of both eyes" (where else in the name of common sense would they have it), "Contusions of the head and different parts of the body" and "Contusions of the whole body having fallen into a well 60 feet in depth". With a refinement of delicacy perfectly unexampled in our experience Syphilis is attempted to be concealed from "eyes polite" under the mysterious initials LV while with contemptuous disregard of consistency both moral and nosological syphilitic diseases figure in various parts of the catalogue. Under the general name "disease" we have no fewer than 16 different parts of the body named as the locality but without any other specific distinction. In one place is the following extraordinary announcement:

> Incised wound in the palm of the hand
> Artery secured by Mr. Surgeon Bland.

We have copied this passage verbatim only putting it in two lines instead of one. We know not whether the compilers intended it for poetry but if so we beg to tell them it is wretched stuff and recommend them to stick to plain prose in future, the other being evidently not their vocation and moreover quite out of place in such a document. It is especially remarkable from being the only instance in the list in which the operation or the name of the operator is mentioned and therefore looks as though it was intended to refer to something more than common. We shall conclude with recommending as quite sufficient for the purposes of such a report and as far more scientific and intelligible the classification adopted in the Returns made to the Registrar General of England with the addition of columns for the results of the treatment.

[1] From the original in the Mitchell Library, Sydney.

Correspondence.

FACTORS AFFECTING THE MORTALITY OF SMALL-BOWEL OBSTRUCTION.

SIR: I would be grateful if you would allow me to reply to Mr. Charles Gale's letter (M. J. AUSTRALIA, January 5, 1957). First, I would like to quote from two world authorities on intestinal obstruction, namely, Professor Wangensteen, of the United States of America, and Mr. Rodney Smith, of Great Britain.

Professor Wangensteen, as you will remember, was the pioneer of suction decompression in the management of intestinal obstruction. In the introduction to the 1955 edition of his book "Intestinal Obstructions" he states:

> It will be indicated that, whereas suction makes the necessity for operative intervention less urgent in a number of obstructions, operation still continues the most important agency in the relief of mechanical obstructions. And despite improvements in techniques of intubating the bowel, there is probably a lesser tendency to protract the period of attempting to achieve decompression by conservative means today than a decade ago. In other words, if in simple obstructions, a definite amelioration of the distension is not detectible on an X-ray scout film of the abdomen within 12 hours after the institution of suction, more ready recourse is had to operative intervention than a decade ago.

Mr. Rodney Smith delivered a Hunterian Lecture to the Royal College of Surgeons in 1947 entitled "Gastro-Intestinal Decompression in the Treatment of Acute Obstructions". This surgeon has done much to popularize the method in the British Commonwealth. Here is what he says in the chapter on "Acute Intestinal Obstruction" in "The Textbook of British Surgery", Volume I, published by William Heinemann, London, in 1956:

> All obstructions seen during the first 24 hours should be treated by early operation. If symptoms have been present for more than 24 hours, it is justifiable to delay operation in some cases. The only criteria for this delay are:
>
> (*a*) No signs at all suggestive of a strangulating obstruction are present.
>
> (*b*) Since strangulation cannot be rigidly excluded, the risk of delay resulting in gangrene of bowel must be considered to be less than the risk of intervening while the patient is grossly affected by dehydration, electrolyte imbalance and intestinal dilatation.
>
> In the opinion of the writer, it is often right to treat a late organic obstruction by a short period of suction and intravenous fluids followed by operation, and occasionally the obstruction is relieved by suction and operation proves unnecessary, but this is very different from setting out to treat obstruction with suction and with the avowed intention of avoiding operation altogether. This is a dangerous method, and it must be recognized that, valuable as the use of suction is, its misuse may be lethal.

Neither these authorities nor myself are opposed to the use of continuous suction, but are emphatically opposed to its protracted use when the patient does not show signs of rapid resolution of the obstruction. Surely there are few surgeons who would allow a sixteen-year-old girl to remain acutely obstructed for seven days following appendicectomy, so that when operation was finally performed, only an enterostomy was possible (see Case 1 in Mr. Gale's paper in M. J. AUSTRALIA, March 3, 1951). Apparently she did not recover from the fæcal fistula for a further two months. Prompt surgical intervention after perhaps a day's trial of continuous suction decompression would seem to have been indicated.

In the fatal cases described in my article and discussed by Mr. Gale, early operation after a short trial of suction decompression would undoubtedly have saved five of the six. I believe that intubation suction alone could conceivably have saved only two (Cases 5, 8).

In Mr. Gale's skilled hands, there is no mortality with post-operative obstructions. If his series is statistically significant, it is no wonder that he will not change his methods. However, the rest of the profession, including Wangensteen and Rodney Smith, are unable to reproduce his results, and must have recourse to early operation after a short trial of conservative treatment.

Yours, etc.,

121 Wickham Terrace, NEVILLE DAVIS.
Brisbane,
January 11, 1957.

THE COST OF DRUGS.

SIR: In a recent article by J. R. May and Neville C. Oswald (1956) in *The Lancet* entitled "Long Term Chemotherapy in Chronic Bronchitis", it is stated that the cost of tetracycline to hospitals in Great Britain is six shillings a grain. Reference to the list of pharmaceutical benefits available under the National Health Service shows that in this country the cost to the Government of prescribing tetracycline is nineteen shillings a grain. Even after allowing for chemists' fees and the lower value of the Australian pound, the difference in the cost of the drug in Great Britain and in this country seems to be beyond all reasonable proportion. May I suggest that, if steps were taken to ensure that tetracycline and other antibiotics were available in this country at a reasonable price, then the medical profession might be freed from the indignity of restricted right of prescription of free drugs which the second schedule imposes upon us and to which, as a profession, we should never have submitted.

Yours, etc.,

86 West Esplanade, JOHN PHILLIPS.
Manly,
New South Wales.
January 17, 1957.

Reference.

MAY, J. R., and OSWALD, N. C. (1956), "Long Term Chemotherapy in Chronic Bronchitis", *Lancet*, 2: 814.

JOHN PARK.

SIR: After all these years C.H. (M. J. AUSTRALIA, December 29, 1956) has said at last what should have been written long ago in letters of gold. The shining courage of John Park has warmed the hearts of his comrades since his gallant death, even as in life his gaiety and charm captivated us. No one could know him and not love him. He was the beloved brother of all and the pride of his unit.

In no war, least of all the savage battle of Malaya, would he have lived long. His generous heart must have led him always to the succour of wounded comrades, as it did on that fateful Monday when the overwhelming Japanese invaders flung back the remnant of the 22nd Brigade from the north-west section of the Singapore defences. Later, when our prisoners-of-war working parties cleared the battle area, he and his three ambulance men were found barbarously butchered.

Although their sacrifice seemed in vain, it was not so—no sacrifice ever is. During the long years of captivity and since, they have remained a symbol and an inspiration to many men.

John Park will always live in the hearts of his friends, but men are mortal. Could not some more permanent memorial bear his name? It would most fittingly be associated with the Royal Australian Army Medical Corps. Perhaps the Director-General of Medical Services could suggest some appropriate medium.

Yours, etc.,

214 Park Street, JOHN F. J. CADE.
West Brunswick, N.12,
Victoria.
December 31, 1956.

AUSTRALIAN RHEUMATISM ASSOCIATION (BRITISH MEDICAL ASSOCIATION).

SIR: Approval has been given on December 19, 1956, by the British Medical Association to the formation of the Australian Rheumatism Association (British Medical Association).

The first office bearers of the Association are as follows: *President*, Dr. L. J. A. Parr;[1] *Vice-Presidents*, Dr. G. McEwen, Professor R. Lovell; *Honorary Secretary*, Dr. Ray Robinson; *Honorary Treasurer*, Dr. Philip Benjamin; *Council*, Dr. Brian Haynes, Dr. Michael Kelly, Dr. Selwyn Nelson, Dr. Roderick Strang, Dr. A. T. Pearson.

Groups have been formed in New South Wales (including members from Queensland), Victoria (including members from South Australia and Tasmania) and Western Australia. The honorary secretaries in these States are Dr. Ray Robinson, Dr. Roderick Strang and Dr. Phyllis M. Goatcher, respectively.

It would be appreciated if notice to this effect could be included in the journal.

Yours, etc.,

R. G. ROBINSON,
Honorary Secretary, Australian Rheumatism Association (British Medical Association).

221 Burns Bay Road,
Lane Cove,
N.S.W.
January 15, 1957.

MEDICAL BENEFITS.

SIR: I was surprised to note that a cheque made payable to me by the Medical Benefits Fund of Australia, and handed to me only the other day by a patient, was dated October, 1956. The patient had held the cheque (and may never have handed it to me) for three months. How often is this occurring in medical practice? We practitioners do not know, but the Medical Benefits Fund of Australia must have a very good idea. The system of posting cheques made payable to doctors to the patients themselves is, in my opinion, unsatisfactory for us, but very satisfactory and profitable for the Medical Benefits Fund.

Yours, etc.,

Sydney, "G.P.".
January 15, 1957.

HYPNOTIC ANALGESIA IN CHILDBIRTH.

SIR: I was pleased to read Dr. H. Steven Greer's article on hypnotic analgesia in childbirth in the issue of December 1, 1956. I have also used this method and found that great success attended my efforts.

The answer, I feel, to the main objection outlined by Dr. Greer, of the necessary attendance of the therapist during the second stage of labour, is the production of analgesia and the same cooperation and feeling of well-being by post-hypnotic suggestion, thereby not necessarily requiring the hypnotist's presence, especially if suggestions along these lines have been given previously.

I found this method successful in the one case in which I used hypnosis. Furthermore, it is possible to pass control to another in the event of the therapist being unable to attend. This, however, requires a deeper stage of hypnosis for conditioning of post-hypnotic suggestion, and as every patient cannot reach the more profound depths, and also as

[1] Dr. Parr has died since his election.

it often takes greater time and effort to get them into these stages, it becomes problematical whether this method of induced analgesia *et cetera* has any benefit, except that mentioned, over that given by Dr. Greer.

I live in hope that more practitioners in this country will use this method of help in childbirth in the future.

Yours, etc.,

HOWARD RIVETT.

Castlecrag,
New South Wales,
January 17, 1957.

WARNING TO SUNBAKERS.

SIR: As a pioneer in the field of malignant growths of the skin due to sunlight, I published in 1917 my first book, "The Influence of Sunlight in the Production of Cancer of the Skin", in which I stressed the possibility of its ill effects. People today are exposing themselves more than ever to summer sunlight.

A secretary of a large outdoor workers' union once suggested that I should draft a pamphlet to be placed in the pay envelopes of their workers. This should now be of material benefit to New Australians. I would suggest that this enclosure might read: "Outdoor workers in the summer sun should always keep the skin covered with some protective garment. Remember that growths which can be produced by exposure to the sun may not become evident until many years have elapsed." Secretaries of large outdoor workers' unions could avail themselves of this pamphlet.

Yours, etc.,

NORMAN PAUL.

143 Macquarie Street,
Sydney,
January 17, 1957.

Post-Graduate Work.

THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

Week-End Course in Neurology.

THE Post-Graduate Committee in Medicine in the University of Sydney announces that the following week-end course in neurology, under the supervision of Dr. George Selby, will be held in the Students' Lecture Room, Royal North Shore Hospital, Crow's Nest, on Saturday and Sunday, March 16 and 17, 1957.

The guest speaker will be Dr. L. Guttmann, O.B.E., M.D., M.R.C.P., Director of the Spinal Injuries Centre, Stoke Mandeville Hospital, Aylesbury, England, who is visiting Sydney at the invitation of the Nuffield Foundation.

The programme is as follows:

Saturday, March 16: 9.30 a.m., "Diagnosis and Treatment of Vertigo", Dr. J. W. Lance; 10.15 a.m., "The Modern Treatment of Parkinson's Disease", Dr. L. S. Basser; 11.15 a.m., "Initial Management of Traumatic Paraplegia", Dr. L. Guttmann; 2 p.m., "Surgical Treatment for the Relief of Pain", Mr. I. Douglas Miller; 2.45 p.m., "The Application of Electroencephalography in General Practice", Dr. L. R. Rail; 3.45 p.m., "The Problem of Subarachnoid Hæmorrhage", Mr. John M. F. Grant; 4.30 p.m., "Peripheral Neuritis", Dr. J. L. Allsop.

Sunday, March 17: 9.30 a.m., "The Early Diagnosis of Intracranial Tumours", Mr. S. M. Morson; 10.15 a.m., "The Management of the Epileptic Patient", Dr. K. B. Noad; 11.15 a.m., "The Diagnosis and Treatment of Facial Pain", Dr. W. J. Burke; 12 noon, "Indications and Scope of Radiological Investigations in Neurological Diagnosis", Dr. George Selby.

The fee for attendance is £3 3s. Written application, enclosing remittance, should be made to the Course Secretary, The Post-Graduate Committee in Medicine, 131 Macquarie Street, Sydney, at an early date. Telephones: BU 4497-8.

Annual Subscription Course.

The Post-Graduate Committee in Medicine in the University of Sydney announces that the following programme has been arranged for March and April, 1957:

Dr. Ludwig Guttmann.

Dr. Ludwig Guttmann, O.B.E., M.D., M.R.C.P., Director of the National Spinal Injuries Centre, Stoke Mandeville, England, will give the following lectures: Wednesday, March 6, at 8.15 p.m., in the Stawell Hall, 145 Macquarie Street, Sydney, "Fundamentals in the Treatment and Rehabilitation of Spinal Paraplegics". Wednesday, March 13, at 2.15 p.m., seminar in the Maitland Lecture Theatre, Sydney Hospital, "Treatment of Spasticity in Spinal Paraplegia". Thursday, March 14, at 8.15 p.m., a public lecture in the Robert H. Todd Assembly Hall, 135 Macquarie Street, Sydney, "The Place of the Spinal Paralysed in Society Today". Friday, March 15, at 1.15 p.m., seminar in the Scot Skirving Lecture Theatre, Royal Prince Alfred Hospital, "Neurophysiological Problems in the Spinal Man". Saturday, March 16, at 11.15 a.m., in the Students' Lecture Theatre, Royal North Shore Hospital, "Initial Management of Traumatic Paraplegia".

Dr. Guttmann's visit to Australia is sponsored by the Nuffield Foundation. His programme in New South Wales has been arranged by the Post-Graduate Committee in conjunction with the Nuffield Australian Advisory Committee and Dr. R. A. Money.

Dr. Merrill C. Sosman.

Dr. Merrill C. Sosman, Röntgenologist-in-Chief, Peter Bent Brigham Hospital, Boston, and Professor of Radiology at Harvard Medical School, will give the following lectures: Monday, March 18, at 8.20 p.m., in the Stawell Hall, "Röntgen Aspects of Heart Disease". Wednesday, March 20, at 8.20 p.m., in the Stawell Hall, "The Accuracy and Reliability of the Röntgen Examination". Wednesday, March 20, at 2.15 p.m., seminar in the Maitland Lecture Theatre, Sydney Hospital, "Röntgen Aspects of Four Esoteric Diseases: (*a*) Vitamin *D* Intoxication, (*b*) Nephrocalcinosis, (*c*) Hæmochromatosis, (*d*) Pulmonary Alveolar Microlithiasis".

Dr. Sosman's programme has been arranged by the Post-Graduate Committee in conjunction with the New South Wales Committee of the College of Radiologists of Australasia.

Dr. A. Ashley Weech.

Dr. A. Ashley Weech, Professor of Pædiatrics, University of Cincinnati, Ohio, Medical Director of The Children's Hospital and Director of The Children's Hospital Research Foundation, will give the following lectures in Stawell Hall, 145 Macquarie Street, Sydney: Wednesday, March 27, at 8.15 p.m.: "Recurrent Abdominal Pain in Childhood." Wednesday, April 3, at 8.15 p.m.: "A Pædiatrician Looks at the Behaviour Problems of Children." Wednesday, April 10, at 8.15 p.m.: "Paving the Way for Accepting the Inevitable."

Dr. Weech will also conduct the following seminars: Friday, April 5, at 1.15 p.m., in the Scot Skirving Lecture Theatre, Royal Prince Alfred Hospital: "Problems of Protein Privation." Wednesday, April 10, at 2.15 p.m., in the Maitland Lecture Theatre, Sydney Hospital: "Signposts on the Highway of Growth."

The following meetings and discussions at the Royal Alexandra Hospital for Children, in which Dr. Weech will take part, are open to members of the subscription course: Monday, March 25, 11 a.m. to 12.30 p.m.: Clinical discussion. Monday, March 25, 1.15 p.m. to 2 p.m.: Medical discussion group. Tuesday, March 26, 11 a.m. to 12.30 p.m.: Clinical discussion. Wednesday, March 27, 1.15 p.m. to 2 p.m.: Neurology discussion. Thursday, March 28, 11 a.m. to 12.30 p.m.: Clinical discussion. Thursday, March 28, 1.15 p.m. to 2 p.m.: Surgeons' meeting. Thursday, March 28, 3 p.m. to 4.30 p.m.: Clinical discussion. Wednesday, April 3, 11 a.m. to 12.30 p.m.: Medical discussion. Wednesday, April 3, 3 p.m. to 4.30 p.m.: Discussion on tuberculosis. Thursday, April 4, 1.15 p.m. to 2 p.m.: Surgical meeting. Thursday, April 4, 3 p.m. to 4.30 p.m.: Clinical discussion. Friday, April 5, 4 p.m. to 4.30 p.m.: Film, "For the Whole Child".

Dr. Geoffrey Organe.

Dr. Geoffrey Organe, M.A., M.D., B.Ch., F.F.A.R.C.S., D.A., Director of the Anæsthetic Department, Westminster Hospital, will speak on the following subject on Tuesday, April 16, at 8.15 p.m., in the Stawell Hall: "Newest Anæsthetic."

This lecture has been arranged by the Post-Graduate Committee in conjunction with the Australian Society of Anæsthetists (New South Wales Section).

The Family Doctor and the Young Criminal.

Four lectures on "The Family Doctor and the Young Criminal", arranged by the Mater Misericordiæ Hospital,

North Sydney, are open to members of the subscription course. All lectures will be held at the hospital and will begin at 8.30 p.m. They are as follows: Wednesday, March 6: "Homosexuality": (*a*) "Its Extent", Mr. C. J. Delaney, Commissioner of Police, New South Wales; (*b*) "How the Doctor Can Help", Dr. J. A. McGeorge. Wednesday, March 13: "The Sociological Background of the Young Criminal", Professor Norval Norris, Professor of Criminology in the University of Melbourne. Wednesday, March 20: "Attacking the Psychiatric Causes of Crime", Dr. J. A. McGeorge. Wednesday, March 27: "Preventive Agencies": (*a*) "Probation", Mr. D. C. Swanson, Principal Probation Officer, New South Wales; (*b*) "Parole", Mr. Frank Hayes, Parole Officer, New South Wales.

SEMINARS AT ROYAL PRINCE ALFRED HOSPITAL.

SEMINARS will be held on the following dates from 1.15 p.m. to 2.15 p.m. in the Scot Skirving Lecture Theatre, Royal Prince Alfred Hospital, Sydney: February 15, Cardio-vascular Section, "Epidemiology of Atherosclerosis", Dr. Kempson Maddox. February 22, Thoracic Section, "Mediastinal Shadows", Dr. M. R. Joseph. March 1, Hæmatology Section, "Unsuccessful Marrow Puncture", Dr. E. F. Thomson and Dr. H. Kronenberg. March 8, Endocrinology and Metabolism Section, "Systemic Lupus Erythematosus". March 15, Neurology Section, "Neurophysiological Problems in the Spinal Man", Dr. L. Guttmann, Director of National Spinal Injuries Centre, Stoke Mandeville Hospital (by invitation). March 22, Gastro-Enterology Section, "Attitude to Treatment of Œsophageal Hiatus Hernia", Dr. S. J. M. Goulston. March 29, Cardio-Vascular Section, "Extracorporeal Circulation". April 5, Pædiatrics Section, "Problems of Protein Privation", Professor A. Ashley Weech, Department of Pædiatrics, College of Medicine, University of Cincinnati (by invitation); to be followed by a meeting at the Royal Alexandra Hospital for Children, when the film "For the Whole Man" will be shown. April 12, Thoracic Section, "The Medical Treatment of Pulmonary Tuberculosis", Dr. Cotter Harvey. April 26, Hæmatology Section, "Effect of Ionizing Irradiation on the Hæmopoietic System", Dr. E. F. Thomson and Dr. H. Kronenberg. May 3, Endocrinology and Metabolism Section, "Osteoporosis". May 10, Neurology Section, "Subarachnoid Hæmorrhage", Dr. R. S. Gye. May 17, Gastro-Enterology Section, "Diverticula in the Upper Alimentary Canal", Dr. A. W. Morrow. May 24, Cardio-Vascular Section, "New Anticoagulants". June 7, Thoracic Section, "Torulosis". June 14, Hæmatology Section, "Antigenicity of Blood", Dr. G. Archer, Red Cross Blood Transfusion Service (by invitation). June 21, Endocrinology and Metabolism Section, "Diabetes Mellitus and Anæsthesia". June 28, Neurology Section, "Diagnosis and Treatment of Hydrocephalus", Dr. R. A. Money. July 5, Gastro-Enterology Section, "Progressive Hepatitis", Dr. A. Skyring.

THE MELBOURNE MEDICAL POST-GRADUATE COMMITTEE.

PROGRAMME FOR MARCH, 1957.

Courses for Higher Qualifications.

Anatomy and Physiology.—Courses in anatomy and physiology, suitable for candidates for higher qualifications, commencing on February 25 at the University of Melbourne, will continue till August, on Monday and Wednesday afternoons—anatomy at 2.15 p.m. and physiology at 4 p.m.

Pathology.—A course in pathology, suitable for candidates for the M.D. and as basic study for Part II of the M.S. and the diplomas, will commence at 1.30 p.m. on Monday, March 4, at the University of Melbourne and continue from 1.30 till 3.30 p.m. on Mondays and Wednesdays till the end of June.

Physics.—A course in physics, suitable for candidates for the D.D.R., D.T.R. and D.C.R.A., will commence on Thursday, March 7, at 4 p.m. and continue till June at the Commonwealth X-ray and Radium Laboratory.

Fees.—Fees for the courses in anatomy, physiology, pathology and physics are £21 per subject. Enrolments, on the committee's form, should be made at least two weeks before commencement of the course.

Surgery.—A course in surgery, suitable for candidates for senior qualifications such as M.S. and F.R.A.C.S., will be conducted at Saint Vincent's Hospital, Fitzroy, from March

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED JANUARY 19, 1957.[1]

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism	1	1(1)	1(1)	1	1(1)	..	..	..	5
Amœbiasis	..	..	..	..	..	..	..	..	..
Ancylostomiasis	..	..	..	..	..	..	..	..	..
Anthrax	..	..	..	..	..	..	..	..	..
Bilharziasis	..	..	..	..	..	..	..	..	..
Brucellosis	..	3(1)	1(1)	..	..	..	..	..	4
Cholera	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus)	..	..	..	..	..	..	..	..	..
Dengue	..	..	..	..	..	..	..	..	..
Diarrhœa (Infantile)	6(5)	11(11)	..	..	..	..	4	4	25
Diphtheria	1(1)	2(2)	..	..	1(1)	..	..	..	4
Dysentery (Bacillary)	..	4	6(6)	3(3)	..	..	..	..	12
Encephalitis	..	1(1)	..	1(1)	..	..	..	..	3
Filariasis	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice	..	..	..	..	..	..	..	..	..
Hydatid	..	..	..	..	..	..	..	..	..
Infective Hepatitis	67(22)	40(15)	..	3(1)	2	4(1)	1	..	117
Lead Poisoning	..	..	..	..	..	..	..	..	..
Leprosy	..	..	..	..	3	..	..	..	3
Leptospirosis	..	..	2	..	..	..	..	..	2
Malaria	..	..	2	..	1(1)	..	..	..	3
Meningococcal Infection	1(1)	5(1)	1(1)	..	1(1)	..	..	..	8
Ophthalmia	..	..	..	..	..	..	..	..	..
Ornithosis	..	..	..	..	..	..	..	..	..
Paratyphoid	1(1)	..	..	..	..	1	..	..	2
Plague	..	..	..	..	..	..	..	..	..
Poliomyelitis	2(1)	..	2	1	..	..	..	..	5
Puerperal Fever	..	..	1	..	..	..	..	..	1
Rubella	..	20(13)	2(1)	31(16)	6(6)	..	..	..	59
Salmonella Infection	..	..	..	2(2)	..	..	..	..	2
Scarlet Fever	4(2)	3(3)	6(2)	5(3)	2(2)	..	..	..	20
Smallpox	..	..	..	..	..	..	..	..	..
Tetanus	..	1	2(1)	..	..	..	..	..	3
Trachoma	..	..	..	..	4(4)	..	..	..	4
Trichinosis	..	..	..	..	..	..	..	..	..
Tuberculosis	36(16)	12(11)	4(2)	9(8)	8(5)	4(1)	2	..	75
Typhoid Fever	..	..	..	..	..	1	..	..	1
Typhus (Flea-, Mite- and Tick-borne)	..	..	1	..	1(1)	..	..	..	2
Typhus (Louse-borne)	..	..	..	..	..	..	..	..	..
Yellow Fever	..	..	..	..	..	..	..	..	..

[1] Figures in parentheses are those for the metropolitan area.

4 to April 26. The programme will include, daily, from Monday to Friday, clinical demonstrations, from 2 p.m. till 4 p.m., and sessions on pathology or operative surgery (and/or discussions), or X-ray diagnosis (three sessions), from 4.15 to 5 p.m. The fee is £31 10s. for the whole course, or 10s. 6d. per session. Enrolments should be made through the Melbourne Medical Post-Graduate Committee, on their special form, by February 18. A detailed programme is available.

Overseas Lecturer.

Dr. A. Ashley Weech, Professor of Pædiatrics, Cincinnati, will be in Melbourne from March 6 to 24. He will lecture for the Post-Graduate Committee on March 20 at 8.15 p.m. at the Medical Society Hall on "Non-Infantile Afebrile Colic". The fee is 15s. but those who have paid an annual subscription to the committee are invited to attend without further charge. Dr. Weech will also take part in the jubilee of the Pædiatric Society of Victoria, which will be held from March 11 to 15, and to which all members of the profession are invited.

Country Courses.

Bendigo.—On March 1, at 8 p.m., at the Bendigo Base Hospital, Dr. Cunningham Dax will lecture on "Early Symptoms of Common Psychoses". The local secretary is Dr. A. J. Walters, 514 High Street, Golden Square, Bendigo.

Warracknabeal.—On March 30, in the Hospital Lecture Room, Warracknabeal, the following lectures will be given: 2.30 p.m., Dr. Donald Lawson, "Ante-Natal and Post-Natal Care"; 4.30 p.m., Mr. Allan Beech, "Management of Chronic Leg Ulceration"; 8 p.m., Dr. G. C. deGruchy, "Generalized Lymphadenopathy".

The local secretary is Dr. J. D. Searby, Warracknabeal.

Fees.—Fees for country courses are at the rate of 15s. per lecture, but those who have paid an annual subscription to the committee are invited without further fee.

Flinders Naval Depot.—On March 6, at 2.30 p.m., at Flinders Naval Depot, Mr. A. B. Alder will talk on "The Urological Significance of Frequency". This is by arrangement with the Royal Australian Navy.

The Alfred Hospital Clinical Society.

On Thursday, March 7, at 8 p.m., the Alfred Hospital Clinical Society, in conjunction with the Residents and Graduates' Association, will conduct a case presentation.

On Tuesday, March 26, also at 8 p.m., Mr. N. T. Hamilton and Dr. H. A. Luke will review cases of ulcerative colitis.

Psychiatry.

The course in psychiatry which the Victorian Mental Hygiene Authority will conduct will commence in early April. It will be open to the profession generally, and inquiries should be addressed to the Chief Clinical Officer, Mental Health Research Institute, Receiving House, Royal Park.

Inquiries.

The address of the Melbourne Medical Post-Graduate Committee is 394 Albert Street, East Melbourne, C.2. Telephone: FB 2547.

Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Alexander, David Adolph, M.B., B.S., 1956 (Univ. Sydney), James Street, Windale, New South Wales.

Langford, Mae Vimiera Adelaide, M.B., B.S., 1956 (Univ. Sydney), 19 Benwerrin Avenue, Carss Park, New South Wales.

Tynan, Patrick James Felix, M.B., B.S., 1956 (Univ. Sydney), 15 Lower Avenue Road, Mosman, New South Wales.

Zawadzki, Irene, registered in accordance with the provisions of Section 17 (1) (*c*) of the *Medical Practitioners Act*, 1938-1955, 38 Wunulla Road, Point Piper, New South Wales.

Burman, Ian Ronald, M.B., B.S., 1956 (Univ. Sydney), Flat 5, 51 Yarranabbe Road, Darling Point, New South Wales.

Baldwin, Douglas Bernard, M.B., B.S., 1955 (Univ. Sydney), 74 Northcote Road, Greenacre, New South Wales.

Medical Appointments.

Dr. M. M. Kehoe has been appointed Government Medical Officer at Collinsville, Queensland.

Dr. George C. Young has been appointed Superintendent of the Mental Hospital, Warrnambool, pursuant to the provisions of Section 35 of the *Mental Hygiene Act*, 1928.

Deaths.

THE following death has been announced:

HOLLOWAY.—Edward Spencer Holloway, on February 6, 1957, at Sydney.

Diary for the Month.

FEB. 18.—Victorian Branch, B.M.A.: Finance Subcommittee.
FEB. 19.—New South Wales Branch, B.M.A.: Medical Politics Committee.
FEB. 21.—Victorian Branch, B.M.A.: Executive of Branch Council.
FEB. 22.—Queensland Branch, B.M.A.: Council Meeting.
FEB. 26.—New South Wales Branch, B.M.A.: Ethics Committee.
FEB. 27.—Victorian Branch, B.M.A.: Branch Council.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

Queensland Branch (Honorary Secretary, B.M.A. House, 225 Wickham Terrace, Brisbane, B17): Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2-3.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such notification is received within one month.

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rate is £5 *per annum* within Australia and the British Commonwealth of Nations, and £6 *per annum* within America and foreign countries, payable in advance.

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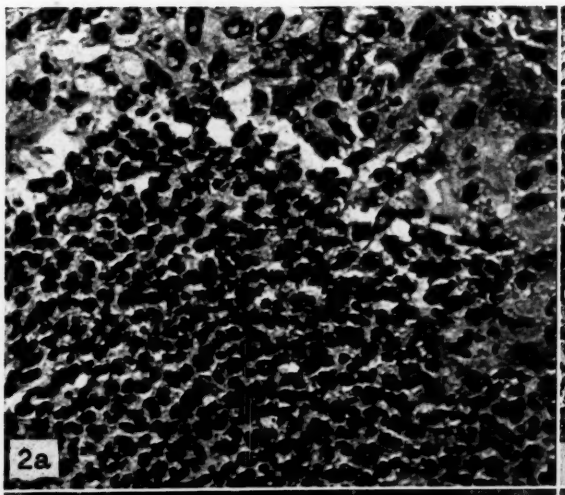

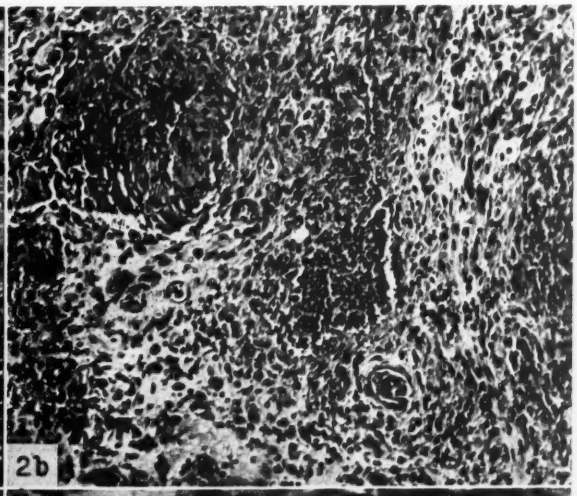

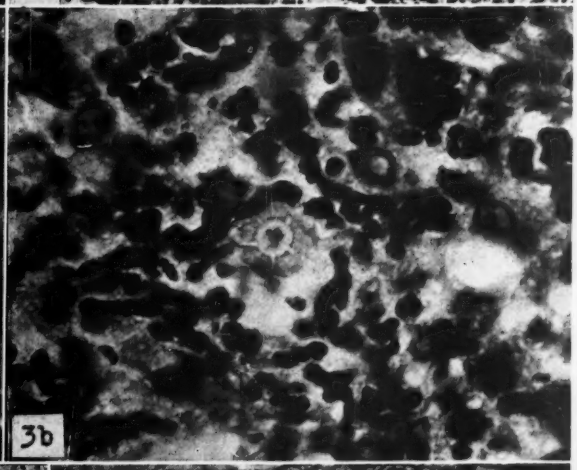

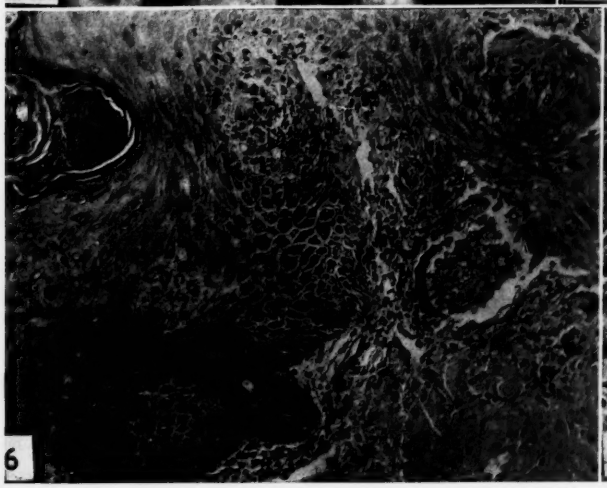

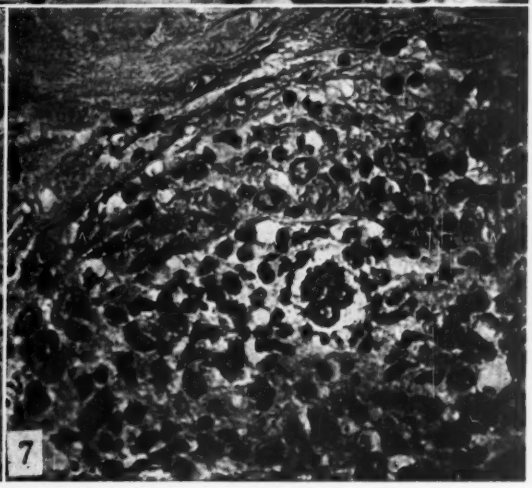

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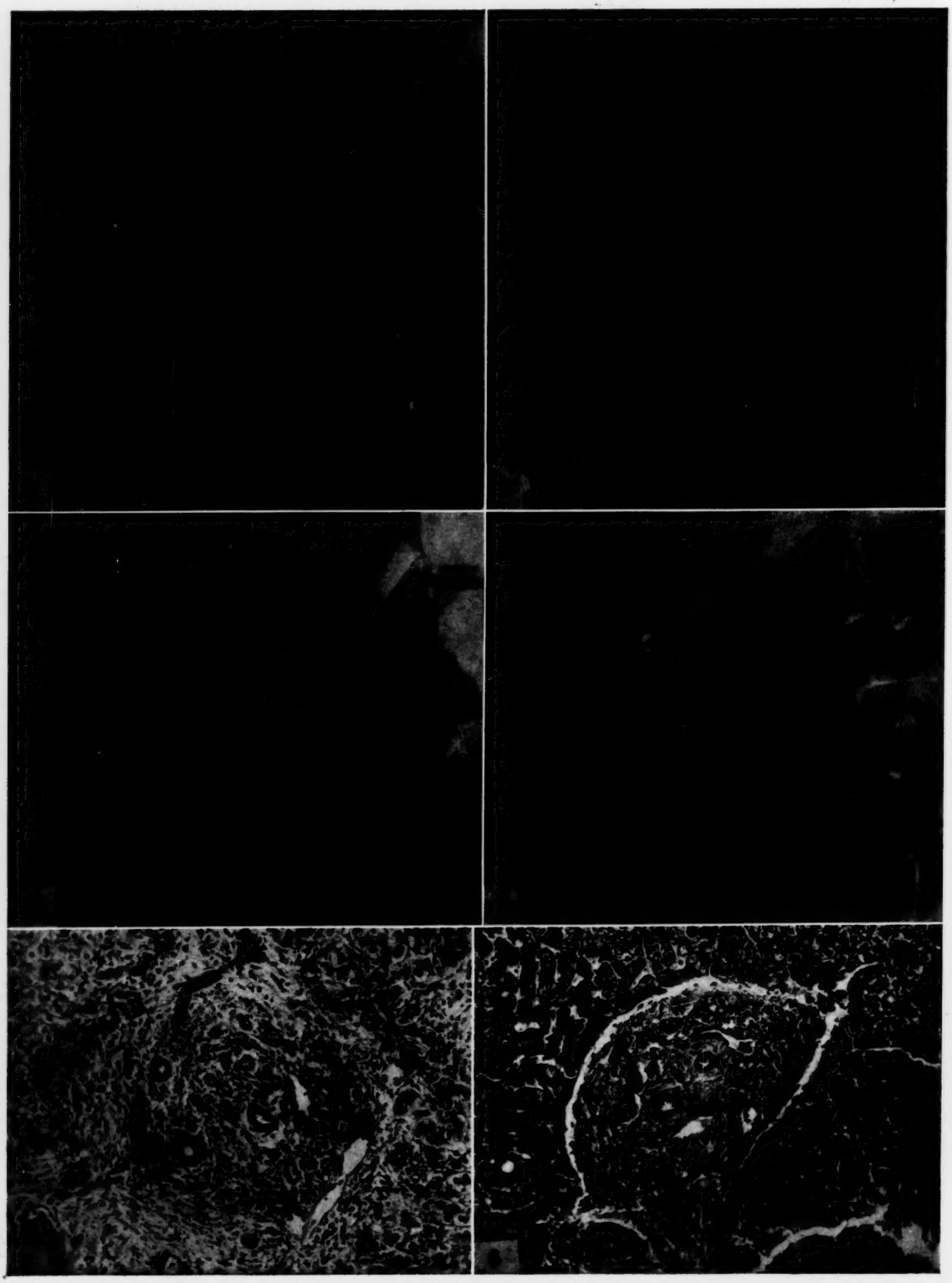

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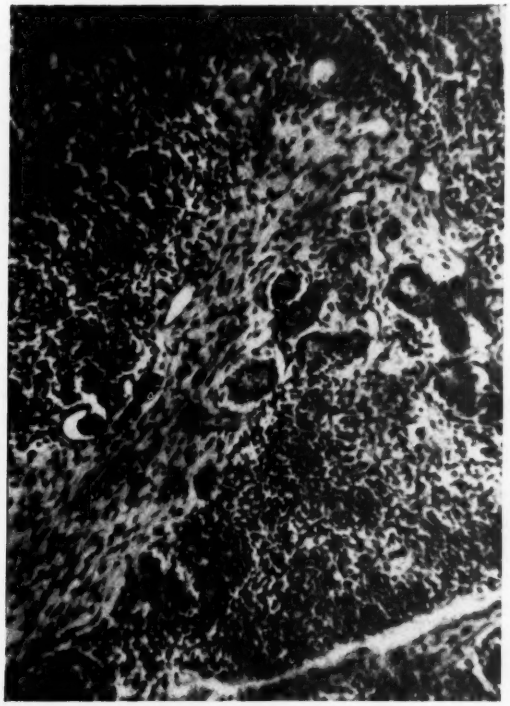

FIGURE II.

FIGURE III.

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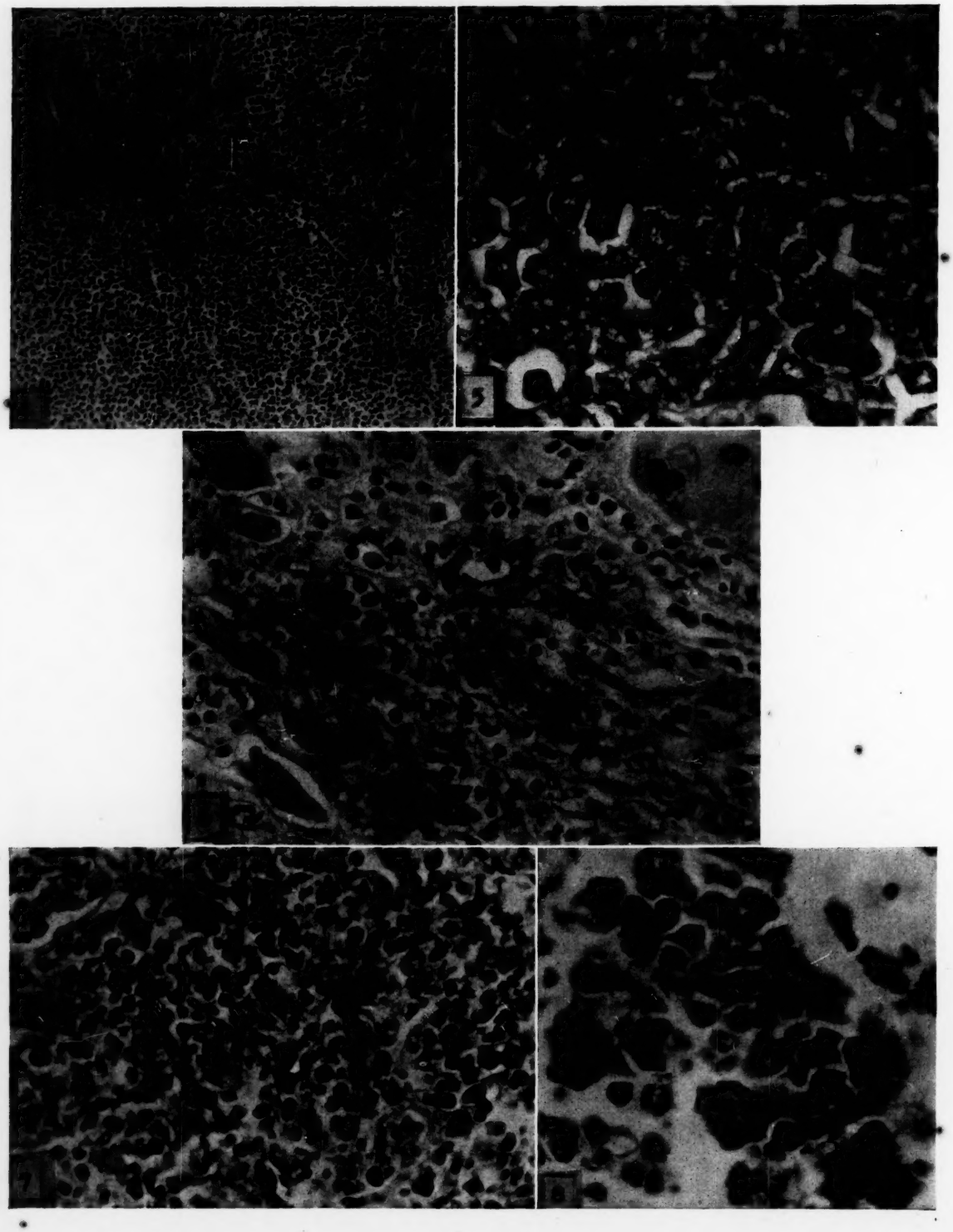
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